THE AUTOMOBILE

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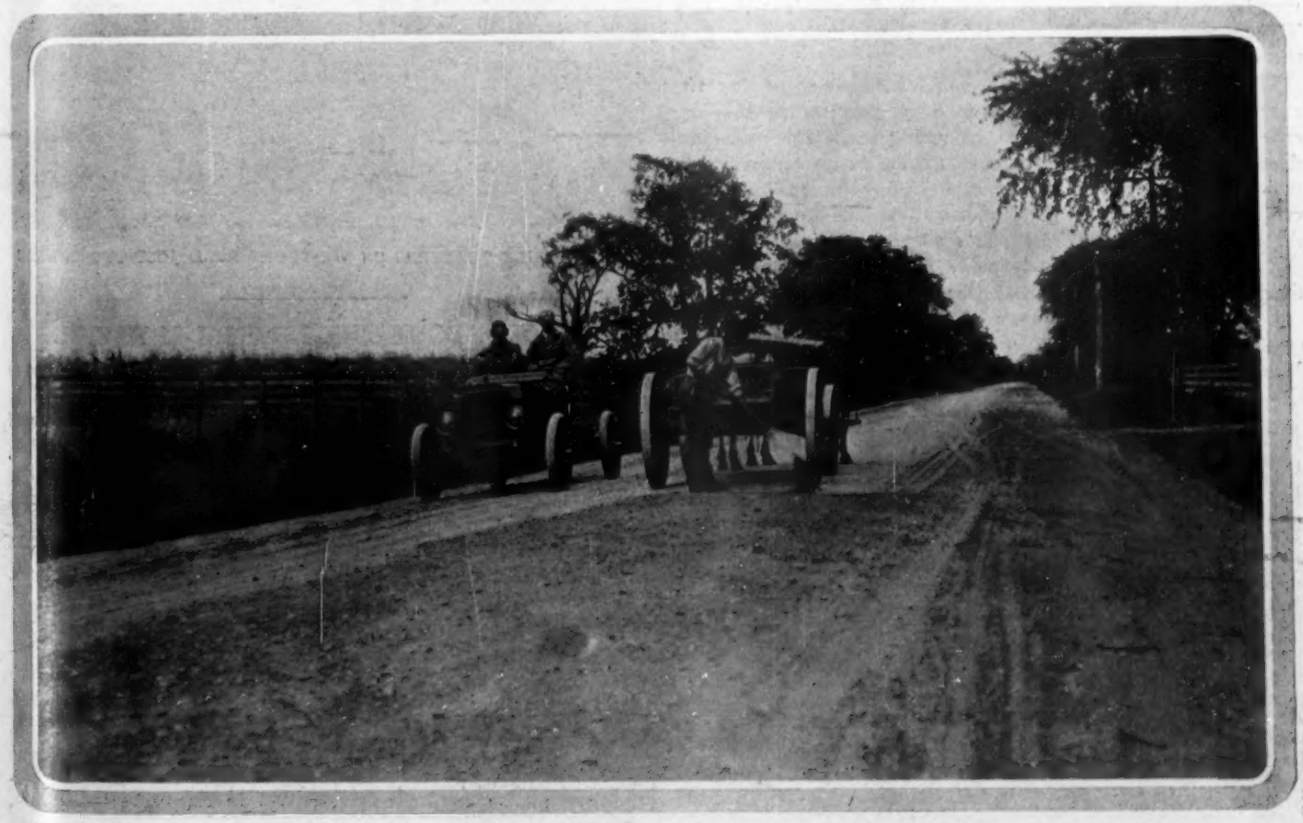
# THE PREPARATIONS FOR THE CUP STRUGGLE

LONG ISLAND is beginning to surcharge with automobile activity. Roads are being repaired, surfaces improved and oiled; quarters are being selected for the high-powered craft, and even buildings constructed for their housing; tire concerns are picking out repair stations, located at intersecting roads; drivers are encircling the thirty-mile circuit in touring cars, becoming acquainted with the turns; and, incidentally, the inhabitants of Nassau County are getting ready for a generous shower of ducats which the automobile army will scatter in its wake.

In laying out the course it was necessary to utilize a couple of miles of road in the town of North Hempstead. Thus, after the supervisors of Nassau County had given their consent for racing over county roads, it was still necessary to obtain the assent of the township authorities for the use of the town road, the supervisors only having jurisdiction over the county highways. Chairman J. D. Thompson's first and written application received unfavorable attention, but subsequently, when he presented the matter in person, the commissioners granted the desired permission, believing sentiment favored such action.

Rational use of the course by the contestants will be insisted upon by the Vanderbilt Cup Commission, and Chairman Thompson will employ special deputies, who will patrol the course during daylight hours. Any illegal use of the course previous to September 22 and between that date and October 6 may prove exceedingly harmful in the carrying out of the race plans, and every effort will be made to prevent the offenders from need-



WORK HAS ALREADY BEGUN ON NASSAU COUNTY ROADS—THIS IS A STRETCH OF THE FAMOUS JERICHO TURNPIKE.

HUBERT LE BLON. GUSTAVE CALLOIS. MONTAGUE ROBERTS.

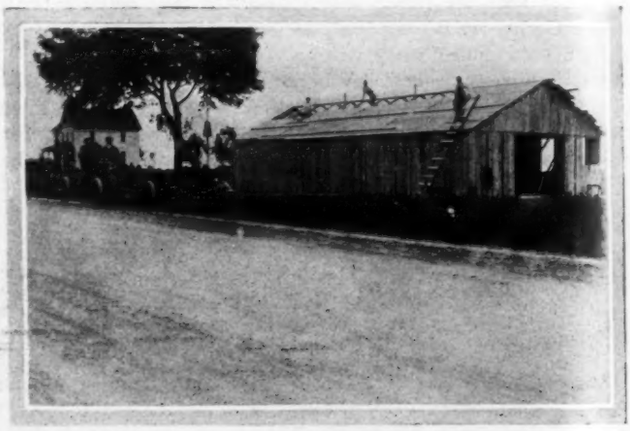
lessly antagonizing Long Island residents. From September 12 to September 22 contestants will have the privilege of driving over the course from daybreak until 7 A.M. with their racing cars, of course conforming to the legal speed limit of town and country. The driver of any racing car violating this rule will become liable to a fine of $500 and disqualification. Chairman Thompson will appeal to the manufacturers to see to it that their employees do nothing detrimental to the interests of the race, calling their notice to the fact that the permissions of September 22 and October 6 do not include a right to occupy the Nassau County roads for a daily racecourse.

The first foreigners to arrive for the race were Gustave Callois and Hubert Le Blon, who came Saturday last on *La Savoie*. Met at the pier by Montague Roberts, the trio which will be entrusted with the Thomas racers were subsequently lunched at the Hotel Astor. Later the American took his French comrades over the Vanderbilt course, which was considered by them a diversified and not a particularly dangerous one. The two noted Frenchmen left on the evening train for Buffalo, for a visit to the E. R. Thomas factory. The Thomas drivers expect their cars to be on the road some time next week.

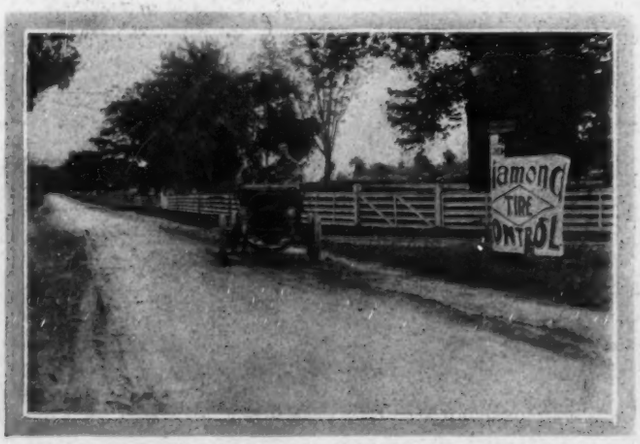
The Oldsmobile Company makes the announcement that after a thorough test of its six and four-cylinder motors, the four-cylinder has been selected for its racing car. The motor will develop upward of 60 horsepower, and the entire car will weigh under 1,500 pounds. This gives, according to the company, a combination of light weight, ample power, and great endurance, three important factors in a long road race. Ernest Keeler, the Oldsmobile driver, has made many trips over the course in a touring car, and expects to have his racer in the next few days.

J. D. Maxwell, the designer of the two Maxwell racers, recently tested the eight-cylinder near the Tarrytown factory. Mr. Maxwell commented in this manner after the trial:

"I am exceedingly satisfied with this eight-cylinder car. It has the speed and the balance to make it easy to handle, and after a few adjustments and some minor changes, it will be ready for the driver, J. Fred Betz, 3d, to try out on the course. This will not be for some days to come. Our work is only half done, however, for we have the twelve-cylinder racer to assemble still, besides the work to be done on this car. But both cars will be ready for us to make a selection and decide which one we desire to use in the Elimination Trial by September 1, as we had figured. In fact, I think both cars will be ready before that date."



OLDSMOBILE QUARTERS ON WESTBURY ROAD JUST OFF COURSE.




ONE OF THE VERY EARLY BIRDS IN THE TIRE LINE

## FACTS ABOUT THE NEW B-L-M RACER.

Among the cars entered for the American Elimination Trial is the B-L-M (Breese, Lawrence & Moulton), a car that will be new to the public and will be interesting because of a number of features in which it differs from other entrants. The weight approximately will be 1,800 pounds, while the motor is rated at 85 horsepower, so that there will be 1 horsepower for each 20.5 pounds weight of the entire car.

Generally speaking, the car will be of the usual type, with four-cylinder motor in front, driving through a helical band clutch, four-speed sliding gear transmission of the selective type, countershaft and side chains to the rear wheels. The engine has separately-cast water-cooled cylinders of 6 inches bore and 6 inches stroke, and the crankshaft has five journals all bored out for lightness, as are also the crankpins. The finished crankshaft weighs forty-five pounds. Pistons are of steel, exceedingly light, weighing only 5 1-2 pounds each. Cylinders are of cast iron and are cast without jackets, these being of sheet steel applied afterwards. In order to avoid the danger of cracking the cylinders near the crankcase—a not unusual form of trouble with light engines of high horsepower—the crankcase is carried high on

the cylinders and the cylinder flanges through which the holding-down studs pass are well up toward the water jackets; the cylinder barrels, below the flanges, fit into and are supported by the aluminum casing.

All the valves, which are mechanically operated, are on the same side of the engine, so that but one camshaft is required. This is made in a single piece, with all the cams for the ignition as well as for the valves integral with it. The ignition is of the Mercedes make-and-break type, with low-tension magneto; a battery and plain coil are used for starting. An extremely interesting method of changing the time of ignition is adopted. The ignition cams are long—in the direction of the length of the shaft—and the toes or highest part of the cams, instead of being parallel with the axis of the camshaft, are arranged like short sections of a single screw thread of very steep pitch, so that the time of ignition can be varied by using different parts of the cams. The short levers that transmit the motion of the cams to the push-rods are arranged to slide along the cams, the time of tripping the igniters varying with the locations of the levers on the cams. All the ... ers move together, but the connecting rods that maintain their ... elative positions are fitted with right-and-left-hand adjusting screws, so that each igniter can be separately adjusted without interfering with the others.

A helical band clutch of the Mercedes type is housed in a recess in the enlarged hub of the flywheel. The flywheel itself is an interesting piece of work. It is of large diameter and comparatively light weight, and has fan-blade spokes, and the entire wheel is cast of bronze. As a precautionary measure, an extra clutch,

ELLIOTT F. SHEPARD, THE AMERICAN WHO DRIVES A HOTCHKISS.

of the reversed cone type with a split ring between the cone and drum, is being made, so that if the helical band is not entirely satisfactory the cone can be substituted.

Four speeds and a reverse are provided by the change-speed gear. The arrangement of the gear is unusual. Instead of having

DESIGNER MAXWELL TRYING OUT HIS EIGHT CYLINDER CREATION.

a primary and secondary shafts at right angles to the countershaft, the primary shaft is at right angles to the clutch shaft, from which it is driven by bevel gears, and the secondary shaft is continued outside the gearcase to form the countershaft, and carries the sprockets on its outer ends. Thus there is no direct drive, all speeds being obtained through gears selectively operated.

Except in the engine, where babbitt bearings are used, Hess-Bright ball bearings are fitted throughout. Wheels are of wood, and the brake drums and rear sprockets, forged integral, are bolted to the spokes. Front and rear wheels are of the same diameter, 34 inches; 3 1-2-inch tires will be fitted in front and 4 1-2-inch tires in the rear.

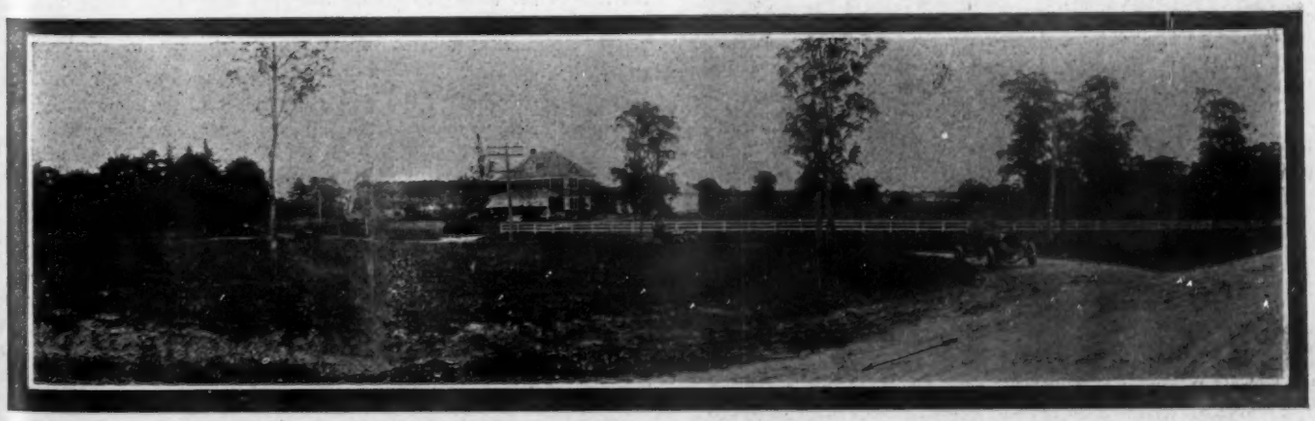
Aluminum alloy is used for the engine crankcase, the gearcase, the two-to-one gear housings and the rotary circulating pump; the alloy is made to a special formula of the B-L-M company and has an unusually high tensile strength.

The car will be noticeably small, and this, of course, contributes to the saving of weight. The wheelbase is but 86 inches, the tread 55 inches, and the machine will set low.

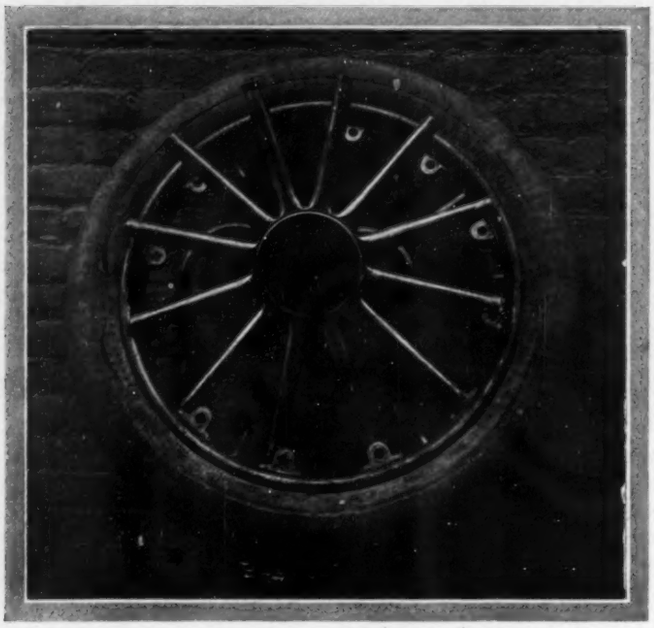
## DETACHABLE RIMS FOR AMERICAN CARS.

Recent automobile contests abroad have demonstrated that racing cars fitted with detachable rims, carrying fully inflated tires, have a substantial advantage over other cars not similarly equipped. Even if the advantage was slight, it might mean much in a close race, for the winning of first place is often a matter of seconds only. The logic of this quickly appealed to the American makers, and the near approach of the American Elimination Trial and the Vanderbilt Cup race has stimulated invention.

Walter Christie has brought forth a rim which its inventor considers second to none, asserting that a change of rims can be effected in less than a minute. Mr. Christie is not averse to granting permission for the use of his rim by several American



THIS V-SHAPED TURN AT OLD WESTBURY MAY SUPPLY THE MOST SPECTACULAR POINT OF THE VANDERBILT COURSE.



CHRISTIE BRONZE WHEEL WITH DETACHABLE RIM.

cars in the American Elimination Trial, though, naturally, he may not care to grant this concession to the fourteen cars other than his own, which will participate in the eliminatory event. Nevertheless, all the American cars which qualify for the Vanderbilt race can use the rim if their makers desire.

The Harburg Tire Company has brought forth a detachable rim, claiming for it extreme simplicity. Several American cars have practically arranged for its use.

It is also understood that one of the foreign detachable rims will be duplicated by another American tire maker, patent rights for same having been practically consummated in the past few days.

### The Rim That Christie Has Brought Forth.

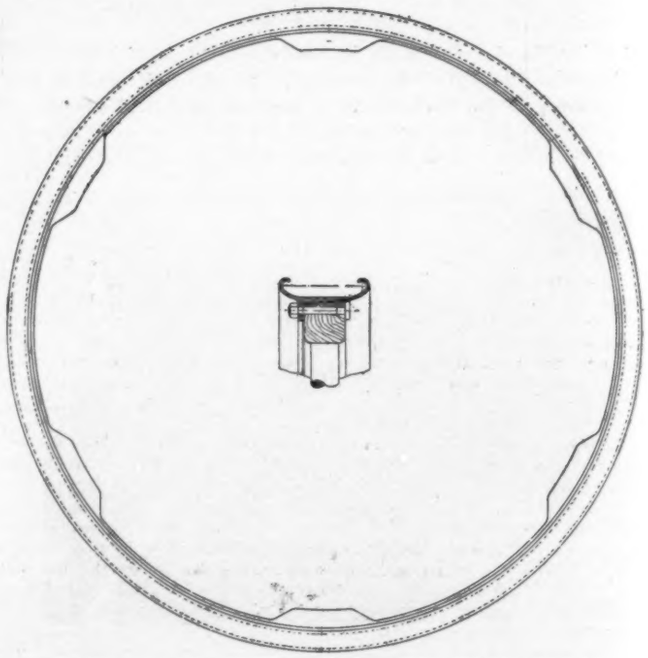
From the Christie Iron Works, New York City, where Walter Christie built his front-drive racer, emanated his quick detachable rim for racing cars. A good idea of the device may be obtained from the illustrations herewith given.

ONLY A WRENCH IS NEEDED TO REMOVE THE CHRISTIE RIM.

Bronze wheels are used on the Christie car, and bronze or steel wheels must be used with the Christie rim. There is no felloe on the wheel; when the rim carrying the tire is removed, there is nothing to the wheel but the hub and the spokes. The rim slips on over the ends of the spokes, and a lug for each spoke projects toward the hub. Through each lug and the corresponding spoke passes a steel bolt, securing the rim directly to the ends of the spokes. A tapered projection on the lug enters a tapered recess in its spoke, so that when the nuts are screwed down the rim is automatically brought into the correct position. A feature of the Christie rim is that it adds little or nothing to the weight of the wheel, there being no necessity for a double rim or for any extra bands or rings. The valve projects through the rim in the usual way, and the tire lugs are fitted in their usual positions, so that the tire can be handled exactly as on an ordinary wheel with a fixed rim, if necessary.

### Simplicity of the Harburg Detachable Rim.

The Harburg rim is the invention of H. H. Boyce, and the patents are controlled by the Harburg Tire Company, 232 West



HARBURG DETACHABLE RIM, SECTION AND SIDE VIEW.

Fifty-ninth street, New York City. Simplicity is the leading characteristic of the Harburg rim. It consists essentially of a clincher rim of the ordinary type with a series of lugs projecting from a flange on its under side, or inner circumference, toward the hub of the wheel, extending over the side of the felloe on the outer side of the wheel. Bolts pass through this flange and the felloe, holding the rim securely in position. In order to make the rim a close fit, and to relieve the stresses on the bolts, the inner circumference of the rim is tapered, and the steel band on the outer circumference of the felloe is tapered correspondingly, so that when the rim is drawn up on the wheel it tightens on the taper and grips firmly. Two of the bolts, on opposite sides of the rim, will be so fitted to the rim flange that it will be drawn off by the unscrewing of the bolts.

The problem of what to do with the valve in a rim of this class is solved by making a valve with a right-angle turn in its stem and cutting a notch in the felloe so that the end of the stem projects sideways from the felloe, instead of from the inside, as is usual. Other ways of arranging the valve have been worked out, but it is probable that this one will be adopted.

Before the first sample rims were finished the system had been adopted for the Locomobile, and the Apperson and the B-L-M racers are probable users.

# FOREIGN METHODS OF DENATURING ALCOHOL

DENATURED alcohol in connection with automobiling is a subject that will assume increasing interest as January 1, 1907, approaches, for on that date will go into effect the act passed at the recent session of Congress permitting the use of alcohol in the arts and industries free of tax. Regulations for denaturing are in course of preparation by the Treasury Department, and officers of that department are investigating conditions under which the work is carried on in foreign countries.

Prof. Charles E. Lucke, of Columbia University, is to make an investigation for the Department of Agriculture of the possibilities of alcohol as fuel. The result of his experiments, as well as those that have been carried on in foreign countries, will be collected and published. It is announced that persons who have patented vaporizers, carbureters, or complete engines, which it is desired to test, may send the apparatus to Professor Lucke at New York. The tests will be conducted without expense to the owners of machines, except that for transportation.

Extracts from information received from U. S. consular officers, and supplied to the Bureau of Manufacturers, contain much valuable material on the subject of denatured alcohol.

### France Still After More Advantageous Method.

Consul-General Robert P. Skinner, says in a report that the last word in regard to the industrial uses of alcohol has not yet been said, nor does he anticipate that American expectations in regard to the general practicability of this fuel as a motive force are going to be at once realized. Mr. Skinner continues:

How far from perfect are the methods now in use may be judged from the fact that, although the French government, by decree dated June 23, 1906, created a commission of analytical methods in regard to alcohol, it is at this time publicly offering prizes for the person who shall discover a more advantageous method of rendering alcohol unfit for consumption than the one now employed, and another prize for the person who shall discover an improved means of utilizing alcohol as an illuminant.

In 1894, on the authority of a manufacturer of a very well-known alcohol and gasoline carbureter, I reported that of 60,000 such devices sold by him annually only 500 were intended for the use of alcohol; and elsewhere 100 petroleum or gas motors were being sold for one alcohol motor. For this state of facts three reasons were given: The high cost of alcohol; excessive consumption, ovidation. There are many alcohol illuminating lamps on the market with which incandescent mantles are used, but they make their way slowly into popular favor. In a word, the whole field of alcohol utilization is one of great fascination to inventors and manufacturers, each of which hopes to be the first in conclusively over coming the several obstacles to complete success.

Denatured alcohol is composed, according to French law, of one hundred parts of ethylic industrial alcohol grading 90° at a temperature of 15° C., of ten parts of methylic alcohol industrially denominated methylene, and which itself is composed of 75 per cent. of methylic alcohol, 25 per cent. of acetone, a certain quantity of impurities, and finally a one-half part of heavy benzine.

### Italian Methods and Processes.

The report from Consul James E. Dunning, of Milan, includes the following:

Methyl (wood) alcohol has no market in Italy, and it is impossible to quote prices from manufacturers to first hands. The entire manufacture of alcohol is in the way of becoming a government monopoly, on account of the heavy taxation placed upon it and the impossibility of importing any stock from outside the country under the protective tariff which stands against it. The present price of ethyl (grain) alcohol to first hands is 54 cents per quart in large quantities at a 95 per cent. proof. The government fabrication tax is $40 for every 100 quarts of alcohol manufactured in Italy, paid by the producer, and the import duty is the fabrication tax plus $7.20 per 100 quarts.

As with the Germans, the Italians use benzol prominently in their process of denaturing alcohol. Mitilene and aniline are also commonly used in this process, as is pyridin, which is obtained from the distillation of coal tar. The details of the process are kept secret by the Laboratory of Denaturants at Milan. For use in the manufacture of artificial silk, alcohol is adulterated with a special denaturant composed of three quarts of acetone, oil of acetone one quart, and sulphuric ether two quarts to every 100 quarts of pure alcohol. This process is directed by a special law, which not only prescribes the terms of the denaturization, but orders that the acetone and oil of acetone shall be furnished in every case by the Laboratory of Denaturants at Milan, at the price of $1.57 per 100 quarts of alcohol to be denaturized. The sulphuric ether used in the process must be supplied by the laboratory and must be approved by a government test before being mixed. The law further fixes the proof of denatured alcohol at 99 degrees, and allows that the denaturization may be accomplished by the use of sulphuric ether alone, in which case the proportion must be 29 quarts to each 100 quarts of alcohol, and the operation must be, as before, subjected to the supervision of the government.

### Not Permitted for Fuel in Belgium.

Consul-General G. W. Roosevelt, of Brussels, reports that as denaturing alcohol for fuel is not allowed in Belgium there is no demand for alcohol as fuel for engines or automobiles. To denature ethyl acholol acetonized methylene is specially used, also ethyl methylcebone, but only on a small scale.

Wood (methyl) alcohol, 100° is quoted at 75 francs ($14.47) per 100 liters (26.417 gallons); grain (ethyl) alcohol, 90°, at 50 francs ($9.65) per 100 liters. Gasoline, for automobiles and motors, sells in iron casks (minimum, 100 liters) for 23 francs ($4.44) per 100 liters.

### When Cuban Planter Appreciates What He Throws Away.

Consul-General F. Steinhart, of Habana, in response to inquiries, furnishes the following report on the production of denatured alcohol, the uses to which put, and the approximate consumption in the island:

The principal consumption of denatured alcohol up to the present time in Cuba is in the domestic household. Consumption in motive power is as yet insignificant, as there are but few motors operated by combustion of alcohol. There are no chemical industries, properly so called, in Cuba, and the pure alcohol is used in mixture with drugs. For illuminating purposes, denatured alcohol is beginning to be used by students and professional persons who reside in the country.

The increase in consumption of denatured alcohol is incalculable from the day that the Cuban planter is convinced that he is, so to speak, throwing away or making a gift to the export commerce of thousands of tons of saccharose in the form of molasses. It may be asserted that the medium of the molasses sold as exhausted contains more than 50° polarization. Consequently, if this molasses is converted into alcohol, setting up distilleries in connection with sugar factories, it would solve the problem of fuel, the most important in the sugar industry, either by the use of motors with an alcohol basis, or by burning it as a spray over the bagasse, as is done by the planters of Louisiana with petroleum.

No other prime material is used in the manufacture of alcohol than the products of the sugar cane. Up to the present time the substance employed to denaturalize alcohol is camphor at the rate of a gram per liter of alcohol.

## STANDARD OIL HAS SIZED UP SITUATION.

PEORIA, ILL., August 27.—The Standard Oil Company has taken steps, it is said here, to acquire all the principal distilleries in the United States. A price has been set on every distillery in Peoria, and the deal may be closed within ten days.

For months the deal has been on, but it was not until last Friday that the distillers placed prices on their plants. This was done at a conference held in Chicago, which was attended by distillers from Peoria, Cincinnati, Terre Haute, Louisville and other distilling centers.

The chief reason for this move by the Standard is the denatured alcohol law recently passed by Congress. Experts for the Standard, after experimenting, reported that the product cannot be manufactured cheaply enough to make it a serious competitor of gasoline, but that it could be used in the manufacture of mercerized cotton, and that it would be a profitable product to control.

# HOW DURAY WON THE ARDENNES

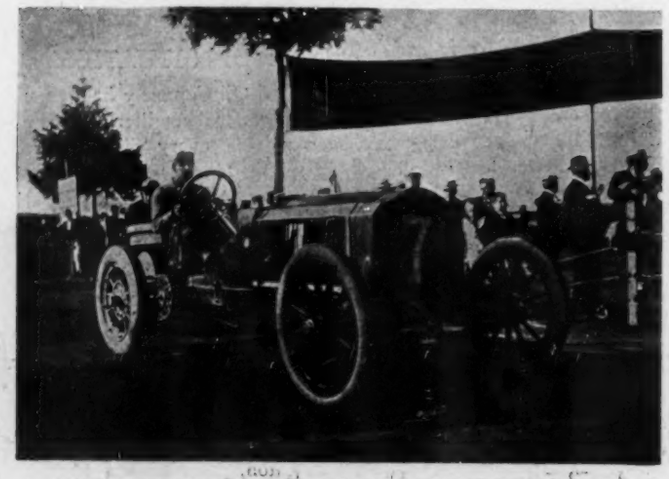
By W. F. BRADLEY.

"MEPHISTOPHELES" JENATZY IN FULL FLIGHT NEAR LONGLIER, DRIVING THE MERCEDES OF ROBERT GRAVES, A. C. A.

BASTOGNE, Belgium, August 20.—In 1902, while France was under the illusion that every automobile contest must start from Paris and finish at some home or foreign city, Baron Pierre de Crawhez proposed a circuit race in Belgium. Nobody had thought that the industrious little country possessed other than cobble-paved roads, and very few people had heard of Bastogne. The town remains just as inaccessible in the heart of the Belgian Ardennes, just as sleepy as ever it was, but the Ardennes Circuit is now a world-famed institution, worthy to rank with Grand Prix and Vanderbilt Cup contests.

Twenty-eight cars had been engaged for the 1906 race, but it was known some time ago that this number would not reach the starting line. Practically all the French Grand Prix competitors were entered except Panhard and Renault. The former decided not to run in another European race this season, owing to the difficulty of bringing the machines down to weight limit, with the addition of mobile rims. Renault was satisfied with the Grand Prix triumph, and preferred to risk no further contest.

From the twenty-eight, the four Hotchkiss cars were early withdrawn. The wire wheels which figured on the Sarthe Circuit were being abandoned for wooden ones with patent rims; the substitution necessitated chassis changes, the work was long, and a leisurely preparation for the Vanderbilt was preferred to rush work for the Ardennes. Three Gregoire cars had been entered, but it was only possible to bring one of them to racing pitch, so keen is the competition amongst the veteran European firms. On the weighing-in day the solitary Gregoire, whilst taking a last spin round the circuit, came to grief on a sharp bend. The machine was put entirely out of service, and Pillette, who was driving, broke an arm, was severely bruised and had his face and eyes injured by the breaking of his goggles. Only by a magnificent effort was the Brasier No. 3 saved from the same fate as the Gregoire. Whilst speeding round the circuit, the Trèfle-à-Quatre came into collision with a Mercedes service car, carrying spare parts. The French car had its radiator smashed, chassis bent, and was towed back to the station in a pitiable condition. A gang of skilled mechanics set to work to repair the damage at 2 o'clock in the afternoon; the motor was dismounted, and the chassis completely stripped. A new radiator was fixed, the frame was straightened out, and by midnight, after a prodigious effort, the motor was back in position, running apparently as well as ever.



VICTORIOUS DURAY, WHO WILL BE IN VANDERBILT RACE.

Count d'Hespel, who was to run a Corre machine in its first great speed contest, had a wild rush to get to the weighing-in shed in time. His new racer had been handed over to him on Sunday morning, and the only trial trip it had was a high speed run into Belgium, arriving at the station just in time to be weighed-in. Foxhall Keene was to have driven his own Mercedes, but failed to turn up for the weighing operation. The actual starters were thus reduced to nineteen.

Of the new men in the list, Sorel had won his spurs in touring contests, and done more than most men to popularize Dietrich machines in India, but had not previously steered a racer. D'Hespel, a gentlemen driver, also made his first appearance in a big race; Salver, who drove a Mercedes for the first time in an important contest, is one of the firm's best mechanics; Demogeot had not previously been seen at work this side of the Atlantic; Garcet de Vauresmont, the

new Bayard-Clement driver, after a brilliant football career, had learned to understand a motor with the Gladiator firm, did some good service with Delaunay-Belleville, and finally entered his services for Bayard. All but Hemery and Wagner's Darracq machines had been fitted with mobile rims.

### How the Race Was Won and Run.

August 13 was the date of the race, and 599 kilometres 998 metres—which no amount of measuring would bring up to an even 600 kilometres—had to be covered by fourteen of France's speed demons and four of Germany's Mercedes flyers. Seven rounds had to be covered, without controls or grade crossings, just a sufficient number to give frequent passages before the grand stand, and enthusiasm was high at the expectation of a brilliant race.

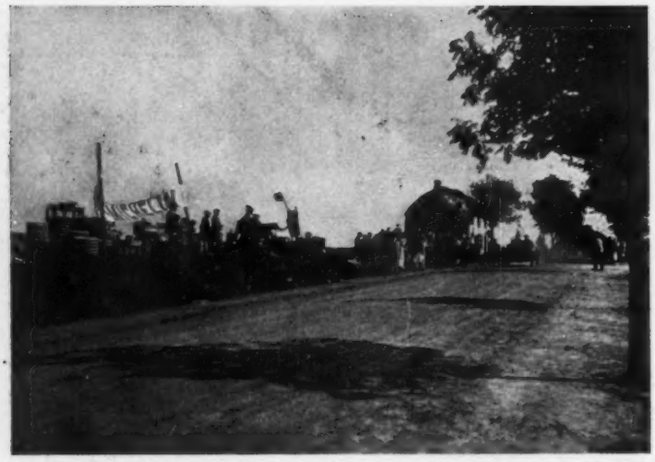
At the stroke of seven, D'Hespel and his Corre went over the line, neither man nor machine having any acquaintance with the circuit. Two minutes later Hemery was away on a 1905 Darracq, to which he had obstinately refused to fit patent rims, determined in his dogged fashion to conquer as he had conquered last year. Albert Clement hid himself in a cloud of smoke and disappeared rapidly. Barillier, calm and smiling, followed with his Brasier. Duray, at the wheel of his big Dietrich, was as gay as a school boy. On his chest he wore a charm given him by Mr. Allen, the United States Dietrich agent, and in his pockets had a big collection to keep off evil spirits. Burton, too, had a happy smile on his big round face, for an unexpected chance had allowed him to sit behind a Mercedes steering wheel once more, Mariaux meanwhile rolling on the ground with pain in the stomach and sorrow in his heart. Salzer appeared as the acrobat of the team, helped to start his own motor, scrambled in over the levers, started off with a rush, and whilst going at full speed released his hold of the steering wheel to adjust his goggles. Pierry was quiet, Gabriel nervous, Demogeot cautious, Bablot happy, and Sorel, the Anglo-Saxon, as superstitious as Duray, the Belgian.

A short interval, and Hemery, starting second, came round

ARRIVAL OF GABRIEL, A DIETRICH PILOT RECENTLY UNLUCKY.

first in a wild rush. The Corre machine had withdrawn. Almost before the Darracq was out of sight, Albert Clement flew down the hill, having maintained his position. Another roar in the distance and either Barillier or Jenatzy was expected. It was Duray and his Lorraine Cross, the sixth starter, but third to finish the round. Wagner's little Darracq was pressing the big Dietrich hard, and looked as if he would pass him before another mile was covered. Jenatzy and Barillier came next, then after a pause Villemain and Burton, the latter going faster than Jenatzy. Rougier and Hanriot followed. Salzer passed with the second best time for the round, Garcet came behind, followed by Gabriel and Pierry, the latter having burst three tires. Bablot, on the Brasier, passed like a flash and spun round like a top when he reached the pave, turning a little further down the road, without any damage, fortunately. Sorel, also, the last to start, had the same experience. Two cars had succumbed on the first round, D'Hespel's Corre and Baras's Brasier.

ALBERT CLEMENT CLEVERLY MAKING A DIFFICULT TURN WHILE PASSING THROUGH BASTOGNE.



THE WINNER USED MICHELINS—SOREL, DIETRICH, IN DISTANCE.

The fastest time for the round was furnished by Wagner in 45:29, Salzer (Mercedes) coming second with 47.13.

On the second round Albert Clement had left Hemery behind and passed the grand stand first, with only five seconds difference on his first lap. Duray had gained a minute on his previous round, and secured for himself first positon. Wagner, Jenatzy, Barillier, Vallemain, Rougier, Demogeot, and Sorel were late. Salzer had done a fast run, and had only just taken second place from Clement. Pierry had to fall out of the race, his Brasier being unable to stand the strain after its accident and hasty repair.

On the third round Clement and Duray were still neck to neck, the latter, however, having the advantage. Hanriot had made the fastest time and right up to him were Wagner and Gabriel, the latter remarkably regular in his rounds.

By the fourth lap it was possible to forecast with a little degree of accuracy the probable winner. Duray was leading, but Hanriot, Clement, and Rougier were pressing him close. The race indeed had worked itself down to a struggle between the Dietrich team, all four of which were well placed. Albert Clement's Bayard, and Hanriot and Wagner's Darracqs.

On the fifth round Duray made his position secure by getting ahead of Clement, who was suffering from tire troubles. By the sixth round it was certain that Duray would win, excluding accidents. There was no lack of interest, however, for the second was only four minutes behind and the six following cars were separated only by seconds. Five hours 38 minutes 39 seconds after his start, Duray shot by the winning post amidst wild enthusiasm and the shrieking of the Marseillaise. "Hanriot! Hanriot!" yelled the crowd, whilst the Dietrich enthusiasm was at its height, and for a few minutes, whilst the timer was preparing his figures, there was a wild clamor amongst the spectators. Although Hanriot had gained three minutes on his rival during the run round, first place was not to be his, the figures put on the board being Duray 5.38.39, Hanriot 5.40.21. Barillier came in third on the Brasier, but foolishly braked his car and stopped on the line, thus losing third place to Rougier by sixteen seconds. Two minutes behind was another Dietrich man, Gabriel, with fifth position. Albert Clement and Sorel were respectively sixth and seventh, with only two minutes between them. Wagner (Darracq) and Salzer (Mercedes) were eighth and ninth, with but four seconds between them. But two minutes later was Jenatzy in tenth position, whilst at the end of the list were the two Bayard-Clement drivers, Villemain and Garcet. Out of nineteen starters, 12 had finished the 600 kilometres within the seven hours' limit.

The most remarkable feature of the race was the complete victory of the Dietrich team. All the four cars finished, securing first, third, fifth, and seventh places. Darracq had the glory of the fastest round of the day, with 45.29, for Wagner, in addition to the 100 kilometres record in 52.49, or 70.52 miles an hour standing start. Bayard-Clement was the only other team to finish the race complete, with sixth, eleventh, and twelfth positions.

## GOOD ENTRY LIST FOR ATLANTIC CITY.

An exceptionally good entry list has been obtained for the three-day meet of the Atlantic City Automobile Club on Ventnor Beach, September 3, 4, and 5. The touring car classes are well filled, and there are several noted flyers in the high-speed events. The free-for-all touring car championship is an event of great interest, and J. E. Bristol, the Brooklynite, who won the John H. Lyons Cup at the spring meet, driving a Pierce Arrow, will be obliged to make a hard fight in order to win the trophy for the second time and thus obtain permanent possession of it.

## THE COMPREHENSIVE TABULAR STORY OF THE 1907 CIRCUIT DES ARDENNES.

| Pos. | Machine. | Driver. | First Lap 53.2 miles. | Second Lap. 106.5 miles. | Third Lap. 159.7 miles. | Fourth Lap. 213.4 miles. | Fifth Lap. 266.3 miles. | Sixth Lap. 319.56 miles. | Seventh Lap 372.82 miles. |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Dietrich | Duray | 0:47:14 | 1:32:32 | 2:33:33 | 3:09:22 | 3:59:25 | 4:47:31 | 5:38:39 |
| | | | | :46:18 | :49:51 | :45:59 | :50:03 | :48:06 | :51:08 |
| 2. | Darracq | Hanriot | 0:48:23 | 1:36:55 | 2:24:32 | 3:12:45 | 4:03:59 | 4:51:52 | 5:40:21 |
| | | | | :48:32 | :47:37 | :48:13 | :51:14 | :47:53 | :48:29 |
| 3. | Dietrich | Rougier | 0:48:02 | 1:37:55 | 2:29:29 | 3:18:40 | 4:11:46 | 5:01:34 | 5:50:11 |
| | | | | :49:53 | :51:34 | :49:11 | :53:60 | :49:48 | :48:37 |
| 4. | Brasier | Barillier | 0:50:07 | 1:39:06 | 2:30:56 | 3:21:10 | 4:10:21 | 5:01:03 | 5:50:27 |
| | | | | :48:59 | :51:50 | :50:14 | :49:11 | :50:42 | :49:24 |
| 5. | Dietrich | Gabriel | 0:48:51 | 1:37:36 | 2:26:23 | 3:19:57 | 4:09:27 | 5:02:46 | 5:52:14 |
| | | | | :48:45 | :48:47 | :53:34 | :49:30 | :53:19 | :49:28 |
| 6. | Bayard-Clement | A. Clement | 0:48:05 | 1:36:13 | 2:26:25 | 3:15:10 | 4:08:26 | 5:12:56 | 6:02:55 |
| | | | | :48:08 | :50:12 | :48:45 | :53:16 | 1:04:30 | :49:59 |
| 7. | Dietrich | Sorel | 0:49:31 | 1:40:35 | 2:34:51 | 3:25:25 | 4:20:32 | 5:10:41 | 6:04:38 |
| | | | | :51:04 | :54:16 | :50:34 | :55:07 | :50:09 | :53:57 |
| 8. | Darracq | Wagner | 0:45:29 | 1:37:11 | 2:26:03 | 3:19:00 | 4:30:05 | 5:27:50 | 6:14:46 |
| | | | | :51:42 | :48:52 | :52:57 | 1:11:05 | :57:45 | :46:56 |
| 9. | Mercedes | Salzer | 0:47:13 | 1:35:18 | 2:29:00 | 3:24:48 | 4:16:27 | 5:05:02 | 6:14:50 |
| | | | | :48:05 | :53:42 | :55:48 | :51:39 | :48:35 | 1:09:48 |
| 10. | Mercedes | Jenatzy | 0:51:40 | 1:46:19 | 2:33:59 | 3:34:23 | 4:27:02 | 5:17:54 | 6:15:09 |
| | | | | :54:39 | :47:40 | 1:00:24 | :52:39 | :50:52 | :57:15 |
| 11. | Bayard-Clement | Villemain | 0:49:07 | 1:42:24 | 2:30:52 | 3:22:04 | 4:19:50 | 5:34:46 | 6:32:40 |
| | | | | :53:17 | :48:28 | :51:12 | :57:46 | 1:14:56 | :57:54 |
| 12. | Bayard-Clement | Garcet | 1:01:00 | 1:50:41 | 2:49:14 | 3:56:38 | 4:55:29 | 5:54:05 | 6:51:37 |
| | | | | :49:41 | :58:33 | 1:07:24 | :58:51 | :58:36 | :57:32 |
| 0. | Brasier | Bablot | 0:48:57 | 1:38:08 | 2:29:46 | 3:23:54 | 4:13:11 | Change speed lever latch broke. | |
| | | | | :49:11 | 51:38 | :54:08 | :49:07 | | |
| 0. | Darracq | Hemery | 0:49:49 | 1:36:43 | Pump siezed, clutch broke. | | | | |
| | | | | :46:54 | | | | | |
| 0. | Darracq | Demogeot | 0:56:10 | 2:35:25 | Front spring hanger broke. | | | | |
| | | | | 1:39:15 | | | | | |
| 0. | Mercedes | Burton | 0:49:31 | Broke clutch. | | | | | |
| 0. | Brasier | Pierry | 0:54:42 | Pump supports broke as result previous condition. | | | | | |
| 0. | Corre | D'Hespel | | Distribution pinion came off shaft. | | | | | |
| 0. | Brasier | Baras | | Broken ball in rear right wheel, damaged bearing, caused wheel to come off. | | | | | |

First line is total elapsed time; second is elapsed time for each round.

# COLLISION FORCES IN AUTOMOBILES

By WILLIAM F. DURAND, Stanford University.

TO those whom fortune or fate may have led into close contact with a railroad or automobile collision, perhaps the most impressive feature is the tremendous display of destructive energy, tearing a railroad car into kindling wood, reducing a locomotive to a tangled heap of iron and steel or smashing an automobile into an indiscriminate pile of match wood, twisted piping, distorted framing and crushed cast iron. Not every collision, of course, results in destruction so complete as indicated, but such possibilities are always present in connection with high speed practice, and some consideration of the more important conditions which determine the amount of destructive energy liberated in the event of collision and the character of its manifestation, should be of special interest to all who are concerned with the automobile, either as to its design or operation.

### Machine Comparable with Projectile.

The situation may be realized most forcibly perhaps by recognizing frankly that an automobile or any other like body moving at a high rate of speed is simply a projectile and in every way comparable, from the standpoint of mechanics, with the projectile from a modern high power field gun. When such a projectile is suddenly arrested in its flight, something must happen. The energy which the projectile has in virtue of its velocity must produce its equivalent in destructive work, and such destruction will be visited either on the projectile or the objects with which it comes into contact or both; depending on the relative strength, hardness and resistant qualities of the two. Thus, if a projectile is fired from a field gun into a mass of timber the latter is much the less resistant of the two, and it is perforated, torn and shattered with little or no damage to the projectile. The entire energy of the latter is expended on the timber with corresponding disastrous consequences. On the other hand, if the projectile is of cast iron and the opposing object a piece of hardened and resistant steel armor, the destructive energy is expended on the projectile and it becomes shattered into fragments. In the more common case when both are hardened and resistant to varying degrees, both are likely to suffer, each in proportion as it receives a greater or lesser share of the energy of the projectile at the instant of impact.

### Brakes Applied at High Speed.

Now the conditions with an automobile, or in fact with any moving object, are exactly similar. In the case of the auto if the brakes are applied when going at high speed, the power being shut off, then the energy of the car is gradually and safely absorbed in overcoming the resistance of the brakes and in doing work which is thus transformed through friction into heat at the brake surfaces and gradually dissipated as such. In other words, the energy of the car is transformed into heat, the brake surfaces are gradually heated up, the heat is gradually conducted away, and no damage is done. Likewise in case the power is shut off on a smooth, level road with clutch thrown out and brakes free, the car runs a long distance before it comes to rest; but in the end its energy is absorbed by the friction of the wheels and such attached mechanism as is kept in motion and in the friction and resistance of the tire on the road. Work is done at all these points, only a slight amount per foot of progress or per second of time, and so the car runs on for many feet or for many seconds before the initial energy is expended and the car comes to rest. If, however, the roads are sandy and heavy, the rate of doing work is much greater per foot or per second, the initial energy is much more quickly absorbed and the car comes to rest correspondingly. Again, if this should occur at the bottom of a hill the energy of the car is used up partly in friction and partly in lifting itself up the grade or slope.

### Effect of Light Obstructions.

To draw nearer to the case of the projectile, if the automobile with power turned off should run into a series of light wooden lattices, the latter would be destroyed while the former would receive no serious structural damage and would experience but slight retardation. Still, with a sufficient number of such light obstacles and supposing friction and other resistances absent, the automobile would gradually and finally be brought to a standstill and the initial energy would have been expended almost wholly in smashing these lattices into kindling wood. Again, if the automobile at high speed runs into a board fence the latter will be smashed with comparatively small structural damage to the former, and with moderate retardation of its speed. A series of such fences would, of course, ultimately bring the machine to rest and more promptly than the lattices as the one is stronger than the other. Going up the scale to the extreme case we finally reach the point where the automobile at full speed runs direct into the face of a cliff of solid rock.* In such case the latter receives but slight punishment while the automobile is reduced to scrap. This is plainly on a parallel with the case of a cast iron projectile which is fired at a plate of hardened steel armor.

### Questions That Offer a Solution.

What is the *rationale* of these varying results, especially with the automobile? It is found in the answers to two questions:

(1) In the case of a collision between two objects, which of the two has the more strength or resistant capacity and which the lesser? The less the strength or resistance to the shock of impact or collision, the greater the share of destructive energy which will be absorbed and the greater the destructive effect, while conversely the greater the strength or resistance against such shock the less the share of energy expended on the body and the less the destructive effect.

(2) Through what distance does the moving body go between the first instant of impact and the time when it is brought to rest? Or, in other words, over what distance is the expenditure of the initial energy distributed? The less the distance over which the retardation acts the greater the average force manifested or required, so that if the body is gradually brought to rest over a long distance or run, the forces manifested or required are but slight and the destructive action will be small. On the other hand, if the body is brought to rest suddenly and within a short distance, as for example within its own length as when an automobile runs into a vertical stone cliff, then forces of the most terrific magnitude are manifested and the strongest material is bent, crushed and broken beyond recognition.

Applying these principles we readily see that in the case of an automobile running into a series of lattices for example, the strength of the latter is much less than that of the former and hence the energy is expended on the lattices rather than on the automobile. Likewise since the forces required are so small the rate of absorption of the energy is slow and a long distance is run by the machine before it comes to rest. The same is true in general and in varying degree if we substitute board fences for lattices. As we ascend the scale of resistance for the obstacle we soon reach a point where the resistance to

*One of the most notable accidents of this character occurred in April, 1903, at the La Turbie hill climbing contest in France. Count Elliott Zborowski lost control of his 60-horsepower racing car at a turn and, at full speed, collided with the side of a cliff. He was instantly killed and his companion, Baron de Pallange, was seriously injured. The machine was badly smashed up.

rupture in the obstacle is perhaps as much as in the automobile, or at least, in some of its lighter parts. In such case the destructive energy will be divided between the two, both will suffer, and, the forces manifested being much greater, the distance run before coming to rest will be correspondingly less. Passing finally to the immovable obstacle, as the stone wall or cliff, the latter can receive only superficial damage and practically all the energy will be expended on the machine. Furthermore, as from the nature of the case the automobile must stop within less than its own length, the most tremendous forces will be brought into play and the machine will be smashed into unrecognizable scrap.

### Striking Energy of Automobile.

As we show at a later point in the more mathematical treatment of the subject, the average value of the force manifested must be such that, multiplied by the distance through which it acts, the product will equal the initial or striking energy of the automobile. Or, inversely, we have at the moment of impact a certain amount of mechanical energy which will be transformed into destructive work measured by the product of the two factors, one the average force and the other the distance run. Hence it follows that the less the one the greater the other and in particular the less the distance the greater the average force.

Now measuring quantities in seconds, pounds and feet we may find the amount of initial or striking energy as follows:

Rule (1) Multiply the weight of the moving object in pounds by the square of the velocity in feet per second and divide the product by 64.4. The quotient will be the striking energy or the work which must be absorbed somewhere in bringing the body to rest. This energy or work will be measured in foot pounds, the unit being the work required to overcome a resistance of one pound through a distance of one foot.

If then we wish to find the average force manifested, knowing the distance, we proceed as follows:

Rule (2) Divide the striking energy by the distance run during the collision or while the body is being brought to rest, and the quotient will be the average force manifested over this distance.

It must not be forgotten that this is a distance average and that at local points and through short distances there will be manifested forces enormously greater than the average. This point will receive further consideration at a later point.

Again, knowing the average force or resistance which may be available for opposing the motion of the body, we may find the distance run as follows:

Rule (3) Divide the striking energy by the average force and the quotient will be the distance run while being brought to rest.

### Example Illustrating Rules.

Thus, let us take for illustration a car in racing trim with a weight of 2,200 pounds and traveling at a speed of 60 miles per hour. The latter speed figures out as 88 feet per second and we have:

$$\textit{Striking Energy} = 2{,}200 \times 88 \times 88 \div 64.4 = 264{,}500$$

Now if the car should have the power thrown off and expend an average brake resistance equivalent to 3,000 pounds at the tire surface, then the car would still travel about 88 feet before coming to rest. If the average total resistances reduced to the tire were as low as 1,000 pounds then the car would run some 264.5 feet before stopping, while with 500 pounds similarly, the distance would be 529 feet. Going now to the extreme, suppose the car stopped within a forward travel of 10 feet for its center of gravity. Then the average force over this distance will be some 26,450 pounds.

If the speed should be 80 miles instead of 60, the higher value being often reached and even exceeded in road racing, then these values for the 2,200 pound car become respectively:

Striking energy, 470,000 foot pounds; for 3,000 pounds resistance, 157 feet run; for 1,000 pounds resistance, 470 feet run; for 500 pounds resistance, 940 feet run; for complete arrest within 10 feet, an average force of 47,000 pounds.

Again, take a large touring car filled with passengers and weighing say 5,000 pounds. Then at the legal speed of 20 miles per hour we shall have as follows:

Striking energy, 66,800; for 500 pounds resistance, 134 feet run; for 1,000 pounds resistance, 67 feet run; for 3,000 pounds resistance, 22 feet run; for complete arrest within 10 feet, an average force of 6,680 pounds.

For a speed of 10 miles these various values would be only one-fourth as great, while for 30 miles they would be two and one-fourth times the above values, and for 40 miles four times the above values. These various illustrative figures will give an idea of the character of the *average* forces which acting continuously would serve to bring the car to rest within a 10-foot run, or assuming the action of continuous forces as specified, an idea of the various distances run before the car would be brought to complete rest.

### Maximum Values of the Forces.

But this is by no means the worst and does not explain the character of the damage which is actually done. In the case of the 2,200 pound machine at 60 miles per hour, an average continuous force of 26,450 pounds over a distance of 10 feet would serve to absorb the energy and stop the car and would then represent the average display of destructive force. The actual destruction, however, implies forces far higher than 26,000 pounds or any force of this order. The existence of such greater forces is readily inferred from an inspection of the results and their existence is explained by the same principles which have been invoked to explain the character and the amount of the average force.

Suppose the framing of the chassis to come into sudden collision with a vertical stone cliff. The latter will suffer some superficial chipping, but in general it will not absorb any considerable share of the energy, so that there will remain practically the entire amount of say 264,000 foot pounds to be expended on the machine. Suppose now that the framing should undertake to hold its own or to yield only to the extent of say 1 inch. Then so far as the fastenings and connections hold, the entire 264,000 foot pounds of energy would be available to create destructive force through that 1 inch, and the result would be the almost instantaneous liberation of a force of some 3,168,000 pounds—that is, supposing the framing to possess sufficient strength not to yield more than one inch and thus to bring about the development of such a force.

Actually when the force has run up to some figure far less than this, rupture or collapse occurs, something breaks or doubles up, the stress at that point is relieved and then as some further resistant item in the structure is reached the force begins to pile up again until the latter breaks or yields, and so on until the entire energy is absorbed and the whole mass comes to rest. The actual operation is therefore discontinuous and irregular to the last degree, one resistant member after another being overcome while the residual energy remains available to run the force up to breaking values, until finally such residual amount may be so small as to be taken up by the natural elasticity of the material. There is, therefore, not the slightest difficulty in accounting for forces of magnitude sufficient to bend, break, twist or crush the structure of the machine in the manner which experience has demonstrated.

### Conditions After Impact.

Now with these considerations in mind let us endeavor to picture the situation of affairs the instant after impact, remembering that the automobile is a highly complex structure with its various parts screwed, bolted, and fastened together in various ways. At the actual point of impact with a rock or

cliff or other vehicle, for instance, there is opposed a resistance to the uniform velocity which all parts possess. The immediate effect is therefore a tendency to arrest the forward movement at this one spot on the machine. The instant this tendency is communicated by means of fastenings or by the action of connecting members to the other parts of the machine, corresponding forces will be set up throughout all parts of the structure and every part will be trying to break its fastenings or to tear itself apart at some point of weakness lying between itself and the arrested part.

Imagine, for example, fifty small balls of varying size and weight tied and interconnected together with string or wire and suppose such a system flying through the air at high velocity. Then imagine one of the balls to be caught and held fast. It is easily seen that the result will be a tendency for the remaining balls to fly onward, that forces will be developed tending to break all the individual fastenings and that so long as these fastenings hold, they will carry back to the point of arrest and put their whole combined effort on the connection between the point of arrest and the remainder of the system.

In the same manner with the automobile, so long as the fastenings hold and the various parts remain connected together, the entire system of forces developed throughout the various parts of the machine will all carry back and concentrate on the one point of attack until it yields under the enormous load thus thrown upon it, and similarly from one point to another until the entire initial energy is used up and all parts are brought to rest.

### Familiar Comparisons.

An interesting comparison may be made with the work required to pull apart longitudinally a bar of steel one inch square and one foot long. For impact forces we shall take this as about 9,000 foot pounds. On this basis it follows that a 2,200 pound machine at a speed of 60 miles per hour would have energy sufficient for the rupture of some thirty such bars at once provided the arrest is sudden and the fastenings of the other parts hold in such manner as to develop the entire manifestation of force at one point.

From this standpoint an instructive view can be obtained by remembering that the energy which a given piece of metal can absorb before breaking is strictly limited by its mechanical properties, and that if a certain amount of energy is to be absorbed in destructive work, then the amount of destruction accomplished must be sufficient to represent the energy to be absorbed. Thus, as we have seen above, the energy of a 2,200 pound automobile at 60 miles per hour would serve to rupture some 30 bars of steel 1 inch square and 12 inches long. If the bars were only 6 inches long then it would require some 60 of them to absorb the energy and in any case they may be taken all at once or in any sequence or combination at will. Again, the same energy if expended in shearing 3-4-inch round steel bolts would cut through 500 bolts before exhausting the supply; or similarly through 260 1-inch steel rivets, or 2,500 1-inch square hard maple sticks or 25 10 by 10 inch square maple sticks.

Such like items might be combined in various ways and may be presented to the action of the destructive energy in any sequence and in any combination, and in all cases the result will be the continued destruction of one item after another until the energy is absorbed and the body brought to rest.

### Comparison with Field Gun Projectile.

Comparison may also be made with the energy of a projectile from a gun, and by the rules previously given it is readily seen that the 2,200 pound machine at 60 miles per hour would have about 25 per cent. more striking energy than the 12 pound projectile from a 3-inch field piece with a striking velocity of 1,000 feet per second. While this comparison may be disappointing so far as the comparatively small size of the projectile is concerned, it must be remembered that in the latter case the energy is very much concentrated while in the automobile it is distributed through an enormously larger volume. Further, as we know from experience, if such a projectile is suddenly arrested by a piece of face hardened armor sufficiently resistant to keep out the projectile entirely, then the latter, though of oil tempered steel, will be crushed and broken into small fragments or in part fused into new forms. This same energy is present in the automobile and is available for manifestation at any one place, as at the point of impact, should it be needed in order to break or tear away such part. Actually no structural part of the automobile has the individual strength or resistant qualities of a 3-inch oil tempered solid steel projectile, and thus long before any such concentration of energy can take place the point of first impact yields and another point is brought into play, and so the destruction proceeds from point to point as already explained.

In case two automobiles of about equal size and weight and with equal speed meet in head-on collision, we have double the total energy to be absorbed and double the material at hand for its absorption, so that the case is essentially the same as for collision with the stone cliff. If a large and heavy machine meets a small and light machine then the sum of the two energies will be quite unequally distributed, the smaller and weaker machine absorbing the greater share with correspondingly greater destructive effect on itself.

### Mathematical Treatment of the Subject.

For those who may be interested in the analytical development of these relations, we may state the equations as follows:

Let $W$ = weight of moving object, measured in pounds.
$F$ = average force over the distance required to bring object to rest, measured in pounds.
$L$ = distance over which force is exerted to bring body to rest, measured in feet.
$V$ = velocity in feet per second,

Then Energy $= \frac{W V^2}{64.4}$ in foot pounds,

$F L$ = measure of destructive work done in stopping the body,

Then $F L = \frac{W V^2}{64.4}$

$$F = \frac{W V^2}{64.4 L}$$

$$L = \frac{W V^2}{64.4 F}$$

Or, otherwise and more generally, let $E$ be any fraction or amount of energy which is lost in overcoming an average resistance $F$ over a distance $L$.

Then:

$$E = F L$$
$$F = E \div L$$
$$L = E \div F$$

In the actual case of automobile collision, $F$, as has been carefully noted, is merely a distance average of the force developed. It means simply that there will be as much destructive work done as would correspond to the exhibition of a force $F$ over a distance $L$. Actually, the destructive work will be made up of parts each one of which may consist of a very much larger force acting through such smaller distance as may be needed for the rupture of the part in question.

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**When a steering gear is properly adjusted** there should be very little lost motion or play in the steering wheel. However, with some types of steering gear there is no provision made for taking up the lost motion due to wear in the worm and sector or nut and screw, as the case may be. In such cases it will be impossible to adjust the steering mechanism so as to eliminate all lost motion.

# EXPERIENCES OF THE GARAGE MANAGER

By HOWARD GREENE.

"YES," said the garage manager, retrospectively, tipping back his chair and putting his feet on the office railing, "queer things happen sometimes in a garage, and we get our share of them. In fact, there are so many curious little incidents happening right along that most of them are soon forgotten; but some are so much out of the ordinary that they stick in one's memory.

"I remember, for instance, the case of a car with a low-tension magneto. The chauffeur came to me one day with a pleased grin on his face and announced that he had a case of 'bug' on his car that would stick me. 'Tisn't safe to brag in this line of business, so I said nothing, but went over to the car. The chauffeur turned the engine over and she started up as nicely as you please, running very slowly—about as slowly as she could turn over running light. Then the chauffeur, standing in front of the radiator, carelessly leaned his arms on the top of the hood. The engine instantly stopped after a few half-hearted explosions. Again he cranked, after tickling the carbureter, and again the engine started, and again it stopped when he leaned on the hood.

"It certainly *did* look like a poser, and I began to think hard how I could save my reputation. My first thought was the ignition system, but there was a low-tension magneto with make-and-break and no wiring except one short wire to each igniter, and there was nothing I could think of that would put all the cylinders out of commission at once. So I passed up the ignition and looked elsewhere.

### Stoppage of the Gasoline.

"Well, to make a long story short, I diagnosed the trouble as stoppage of the gasoline supply, caused by peculiar conditions. A small shoulder was worn into the needle-valve in the carbureter, with the result that the valve closed and shut off the supply of gasoline from the spray nozzle when it should have been slightly open. The slight vibration of the engine, however, kept the valve jiggling about on its seat just enough to let a little gasoline pass and keep the engine running slowly. When the chauffeur leaned on the hood the vibration was interfered with sufficiently to stop the jiggling of the needle valve, and the engine of course stopped of starvation. We took out the valve, smoothed it up by taking off the shoulder, and the trick was done. At ordinary speeds or when on the road there had been no trouble.

"Another queer case of mysterious behavior occurred with a motor having a high-tension magneto. The trouble was that the motor would skip sometimes, for no apparent reason. Sometimes one cylinder would miss, and sometimes another: and sometimes two or three, or even all of them, one after another. It looked like a ground in the single wire that carried the current from the magneto, and I wet my fingers and ran them along the wire, bracing myself to take the shock that would prove that I was right. No shock came, though, and moreover, while I was holding the wire up the engine ran without a miss; but as soon as I dropped the wire the missing began again. So I nosed round a bit and soon found the trouble. The wire was attached to the magneto by a ball-and-socket terminal, and a good deal of dirt had worked into the socket and caked in it. Most of the time there was a fairly good connection—enough for the high-tension current—but every once in a while the vibration would bring the connection into such a position that the dirt cut off the current, and one or more misses followed. The remedy was of course to clean the connector, when the trouble stopped. When I lifted the wire to examine it the connector was pulled round so that a good connection was made, which accounted for the perfect running while I was looking for the 'bug.'

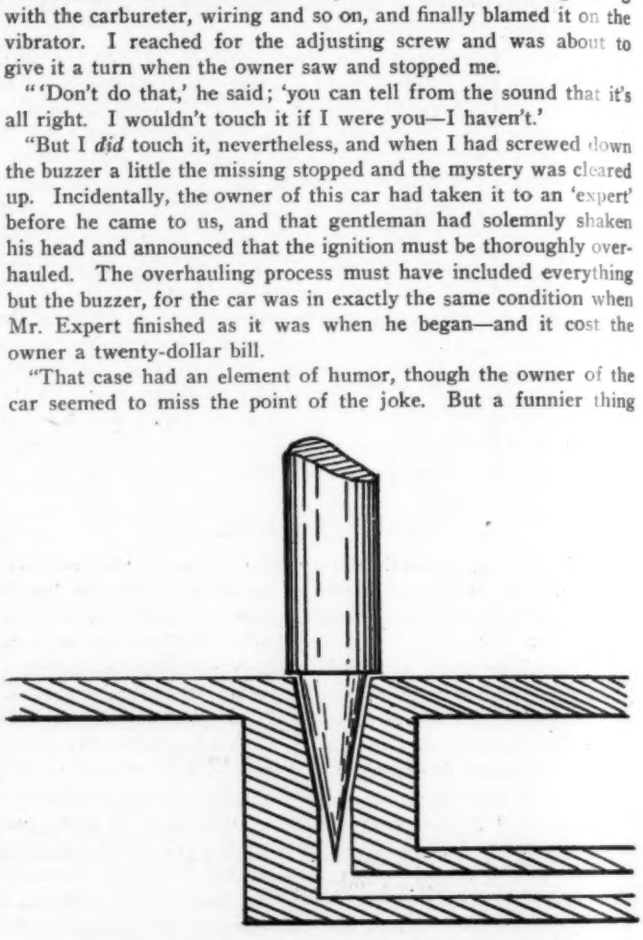
### Sound of the Vibrator.

"You can't always depend upon the sound of the vibrator as an indication of what is going on between the sparking points in the cylinder. The other day a car came in here missing explosions in a most annoying way, and nothing the owner could do had any effect, except that sometimes he made matters a little worse. I looked over the machine carefully and could find nothing wrong with the carbureter, wiring and so on, and finally blamed it on the vibrator. I reached for the adjusting screw and was about to give it a turn when the owner saw and stopped me.

"'Don't do that,' he said; 'you can tell from the sound that it's all right. I wouldn't touch it if I were you—I haven't.'

"But I *did* touch it, nevertheless, and when I had screwed down the buzzer a little the missing stopped and the mystery was cleared up. Incidentally, the owner of this car had taken it to an 'expert' before he came to us, and that gentleman had solemnly shaken his head and announced that the ignition must be thoroughly overhauled. The overhauling process must have included everything but the buzzer, for the car was in exactly the same condition when Mr. Expert finished as it was when he began—and it cost the owner a twenty-dollar bill.

"That case had an element of humor, though the owner of the car seemed to miss the point of the joke. But a funnier thing



EFFECT OF WEAR ON A CARBURETER NEEDLE VALVE.

Vibration causes friction between valve and seat, wearing shoulder on valve, which tends to close valve when it should be partly open. Purposely exaggerated.

happened not long ago, and it was some time before any one could get around to the funny side of it. I had a couple of green men in the garage, and I set them at work one day putting a new pair of tires on a car, giving them three new tire irons for the purpose. Well, they got the tires on all right, but when the job was done one of the irons had disappeared, and no one could account for it. I got rather hot under the collar, for it's bad enough to lose old tools, but it's worse to get skinned out of brand new ones. But the men seemed honest and I couldn't doubt them when they declared they knew nothing about the missing iron. I had almost forgotten all about it when the owner of the car came in with one of his tires flat and some of the most extraordinary excrescences on it I ever saw off an alligator. We ripped off the shoe and took out—the missing tire iron! How an able-bodied man, awake and sober, got such a thing into a tire without knowing it will never be explained to my satisfaction. Of course the tire was ruined, and we had to stand the price, so no one was seeing anything funny about it at the time.

### An Odd Experience with Tires.

"Talking of tires reminds me of a funny incident that occurred last year. A man brought his car in with a flat tire and wanted a new tube put in. We took off the shoe and found that there

was no inner tube in the thing at all—nothing but the shoe and the valve sticking through its hole as innocently as possible. The thing was rather a joke on the owner, who had given instructions to have the old tube patched. The secret of it was that the car, a light one, did not have any lugs on the wheels, so when the tire went flat the inner tube managed to work out unnoticed, and, tearing away from the valve, stayed behind on the road.

"Chauffeurs sometimes make us garage people laugh. There was one chap whose employer kept his car here, and he was a cracker-jack. We used to be treated to telephone conversations that were the limit. Of course we could only hear one end of it, but we could easily imagine the rest. The employer would call up and ask to have his car sent round right away, and the message would at once be transmitted to the chauffeur. That worthy young man would hurry to the telephone with an anxious look on his face and call up his boss.

"'Hello! Hello! That you, Mr. Jones? Well, say, I can't bring the car round now—she's not running.'

"Then Mr. Jones would probably ask what was the matter.

"'Well, you know that thingumabob up there on the dash? That's connected with the what-do-you-call-it under the footboard, and I don't know whether its a key or a pin, but the car won't run till it's fixed. What's that? No, I don't know exactly what's the trouble yet, but I will pretty soon, and when I get the thingumabob fixed she'll run all right. Good-bye.'

"We used to be treated to this pretty often, but we never found out just what it was that went wrong. The young genius didn't last long.

"One young man tried a queer stunt to cover his ignorance of the whys and wherefores of the gasoline engine. His employer brought the car in himself, and next day sent the chauffeur for it. The chauffeur started the engine and took the car into the street, and immediately started to 'adjust' things all round. In about ten minutes the car was as dead as a nail. I saw that the young fellow was in deep water, and was willing to help him out if I could, so I went out and asked casually as I passed, 'What seems to be the trouble?' Next minute I was floored by the young man's answer.

### Engine Too Fast for Clutch.

"'The engine runs too fast for the clutch,' he said.

"He didn't last long, either, and his career was shortened by the fact that he told his employer the car was put out of commission by garage employees tinkering with it.

"Ignorance is not by any means confined to any one line of business, of course, and I was reminded of this rather forcibly one day when I was talking to the salesman of a machine tool house about the purchase of a lathe. I remarked that I thought we had better get a lathe of good size so that if necessary we could put a flywheel into it for truing up.

"'Yes,' said the 'catalogue salesman,' gravely, 'the webs of the flywheel are very apt to *get bent* in case of a collision, and a big lathe would be very handy for truing up the wheel.'

"I looked as innocent as I could and asked if it was a fact that cast-iron would bend like that.

"'Oh, yes,' he replied, smiling genially; 'bends like the deuce sometimes.'

"I couldn't resist the temptation to take a little rise out of him by letting him know that I wasn't entirely green, but he wriggled out of it by a masterly flow of language. It's pretty hard to get the best of your genuine catalogue salesman.

### Had Hot Tube Ignition.

"Some time ago we had a Panhard of the old type in the shop—one of those with hot-tube ignition—and they had no end of fun with the burners. I remember one occasion in particular. I happened to go out into the garage, and I saw the chauffeur on his knees in the footboard blowing into the filling hole of the small tank that carried the gasoline for the burners, his cheeks swelled out like a young balloon. Every little while he would stop blowing and clap his hand over the hole and yell at the man who was helping him:

"'Now! now! See if you can't light her now.'

"But she wouldn't light. I went over to see if I could help them out and found that there wasn't a drop of gasoline in the tank, and the young man had been doing his level best to light his own breath with a match. He explained by saying he thought the gasoline supply came from the main tank, and someone had told him that if it didn't flow to the burners readily it could be started by blowing into the tank. Probably he would have been blowing yet if I hadn't happened along and stopped him.

"I could tell no end of yarns about people who have tried to start their electrics with cranks, poured water into their gasoline tanks, wired up their batteries to the carbureter and other freak things of that sort, but they aren't specially interesting except as a temperance lecture."

## ROAD IMPROVEMENT IN MICHIGAN.

LANSING, MICH., August 20.—Many applications for state reward roads are being received by the State Highway Department, and it is more than probable, from present indications, that Michigan will see something out of the ordinary in road building next year. Some of the newer counties are making wonderful progress in the matter of highway construction. In Tuscola County a great deal of fine gravel road is being built, and already the effect upon the value of the farming lands is being felt. The older counties are being left behind in the race. Saginaw county will have in the neighborhood of fourteen miles of road, nearly all of it macadam, and will get about $10,000 of the state reward money this year. Applications for roads for next year are also being made from there. Bay county, Iosco county, Mason county and many of the counties at present regarded as pioneer country are going ahead with a vim in the matter of road building.

Some remarkable roads are being built near Manistee. In some places the grading, together with the necessary cuts and fills, costs $2,000 a mile, and, in some places, the highway commissioner has been compelled to sod the sides of the cuts to prevent them from caving in and to keep the shifting sand from covering the roads.

Tuscola county has an enterprising highway commissioner. He is not only hustling for good roads for his section, but he thinks of things for convenience. The gravel that is used must be of a grade which will permit a large per cent. of it to pass through an eight-inch screen. This commissioner has a corn popper that is of the required coarseness and with this he tests gravel.

### Michigan's Roads Work Under Earle.

DETROIT, MICH., August 27.—The cause of good roads grows apace in Michigan, the movement recently inaugurated having already taken a firm hold. Detroit automobilists and manufacturers are taking an active part in the campaign being prosecuted by State Highway Commissioner Horatio S. Earle, and their efforts promise to bear fruit. Direct appeal has been made to 20,000 laboring men in Wayne County, the advantages accruing to them in the form of added labor through the adoption of the county road system being dwelt upon at length. In addition, every automobile owner has been notified that on September 17-18 an opportunity will be afforded to vote on the question of adopting the county road system, coupled with an appeal for favorable action.

Should the plan be adopted three road commissioners, to be appointed by the Mayor and County Clerk, would take over the principal public thoroughfares leading into Detroit and build them of crushed stone, afterward keeping them in repair, the state paying $1,000 a mile toward the expense incurred in the building of these roads.

# LETTERS INTERESTING AND INSTRUCTIVE

### Rearrangement of the Fuel Supply.

Editor THE AUTOMOBILE:

[375.]—The gasoline tank in my car is located under the seat, and I desire to place it at the rear of the chassis, low down, so as to utilize the space in the seat for other purposes, and at the same time lessen the chances of damage, should the gasoline take fire. What worries me is about the feed to the carbureter. The carbureter is fully a foot higher than the tank will be, with the car standing on a level. Other cars with a similar arrangement have pressure feeds of one sort or another, but I am at a loss to decide between them. Can you tell me which in your opinion is the best, and give me some suggestions for making the changes?

Bloomingdale, N. Y. HERMAN KNEELAND.

The pressure scheme is all right, and is much used. Probably the simplest method involves the use of an air pump to get up the pressure above the fuel, the filling nozzle, of course, being made to close air-tight. Another plan, avoiding the pump and the attendant labor, consists in diverting exhaust gases from the engine to the tank, as a means of securing the required pressure. This use of the exhaust gases, however, is objected to by some because of the remote possibility—by no means a probability—of the formation of an explosive mixture in the free space above the fuel, which could become ignited by the exhaust heat. Still another plan is to heat the fuel by the exhaust without introducing any of the exhaust gases into the tank. This produces a vapor pressure above the fuel, and the heating does no harm because there is no air in the tank, which makes combustion impossible. Though not without some complication, the use of a small pump, kept constantly working, to force the fuel from the main tank into a small running tank within the bonnet, is not without marked advantages. An overflow from the running tank to the main tank permits any fuel pumped in excess of that required to return to the main tank.

### The Passing of the "Spark Gap."

Editor THE AUTOMOBILE:

[376.]—What has become of the "spark gap" which at one time promised to come into vogue as a solution of ignition troubles. Did its merits prove less than was supposed, or was there some other reason? EMIL BAUER.

Indianapolis, Ind.

The purpose of the spark gap was to insure passage of the current between the terminals of a jump-spark plug. This it did by a gap of one-thirty-second of an inch, or less, in the secondary circuit outside of the cylinder. Such a gap was found to bring about a sort of current surge, which caused the current to pass between the plug terminals under circumstances in which it otherwise would short-circuit through a deposit of soot on the plug insulation. Besides this, the outer gap could be placed in view of the driver, where it became a fairly reliable index upon the working of the ignition system. But it used more current, and for this reason was gradually discarded.

### The Effect of Oiled and Tarred Roads on Tires.

Editor THE AUTOMOBILE:

[377.]—Will you kindly explain in your journal the effect on rubber tires of road surfaces treated with (a) oil, and (b) tar preparations. Which causes the greater injury to tires?

Summit, N. J. W. J. HARRISON.

Though oiled and tarred roads have been tried in many localities within the past few years, we are unable to find any complaints to the effect that road surfaces thus treated exercise an injurious effect on tires. While it is true that oil ordinarily exercises a destructive action upon rubber, this action is at its worst fairly slow. And, with the heavy crude petroleums utilized in road making, it is questionable whether it exists to a material degree. We shall be pleased to give space to the publication of any facts indicating the contrary. Tar possesses no destructive effect whatever upon rubber.

### Valve-Stem Lubrication.

Editor THE AUTOMOBILE:

[378.]—I have a small car on which there is no provision whatever for lubrication of the valve stems, where they pass through the cylinder casting. Oil applied with a can will not stay in place, and I am thinking of fitting some sort of a grease cup at this important point. What arrangement would you suggest as the most likely to prove satisfactory?

Waterbury, Conn. DR. WM. BLUNDELL.

Your car is not exceptional in the respect you mention, for it is not customary with automobile designers to lubricate valve stems, unless in the case of their lower ends, though sometimes inlet-valve stems are lubricated throughout their length. The heat to which the upper end of an exhaust valve is subjected is such as to make its lubrication almost as impossible as it is unnecessary. The usual practice is to pass the stem through a rather long sleeve, perhaps of brass or other metal, that works in contact with steel without excessive friction. The opening through this sleeve, without being really loose, is sufficiently large to allow the stem to move very freely. There even may be some slight leakage of the exhaust gases between the stem and the sleeve, but as long as the majority of the exhaust goes to the muffler little harm is done. The beveled edges of the valve insure its proper centering upon its seat, and it is clear that too high an accuracy of fit around the valve stem would necessitate exceedingly close work to register it exactly concentric with the valve head. We venture to say that your engine is not suffering from the lack of lubrication at this point, and would not advise the alterations you suggest.

### Front and Rear Tire Sizes.

Editor THE AUTOMOBILE:

[379.]—Why is it that so many makers of large cars are adopting the practise of using heavier tires on the rear than on the front wheels? I understand, of course, that the work on the rear wheels is greater than that on the front wheels, but, when tires sufficiently heavy to meet this demand are decided upon, why cannot equally heavy tires be used in front, thus facilitating changes and making necessary the carrying of only one extra shoe?

Atlantic City, N. J. CHAS. M. DEARBORN.

Heavy tires on the front wheels tend to make steering difficult, because of the greater area they will, under many circumstances, present to the ground. This increases the force necessary to pivot them about the center of support. Also, in case of puncture, the reduction of wheel diameter consequent upon the sudden deflation is less with a small tire than with a large one. On this account, the likelihood of dangerous derangement of the steering is reduced, since a marked difference between the two wheel diameters tends to force the car off the road, unless the driver has plenty of room in which to bring it back to its normal line of travel. With small cars, these objections scarcely apply, as is obvious, all of the tires being small enough.

### The Hydroplane for Speed Boats.

Editor THE AUTOMOBILE:

[380.]—I have just read an account in a foreign paper, in which a very small and apparently very remarkable motor boat, only thirteen feet long and three feet wide, and driven by a nine-horsepower gasoline engine, is credited with the extraordinary speed of thirty-five knots an hour. Is this possible, and what is the gliding principle referred to in connection with the design of this boat? ALFRED G. CARR.

Mount Vernon, O.

We presume that your query refers to *The Ricochet*, a new French boat that seems to have performed in accordance with your description. This boat, we understand, is the latest evolution of the hydroplane principle of boat design, which first came into prominence a year or so ago, at which time a small hydro-

plane boat, with a 17-horsepower engine, did something better than twenty knots on a Swiss lake. The idea is simple, and consisted in its first form of a series of flat planes, canted at a slight forward angle, affixed to the under side of two catamaran hulls. With forward motion, these planes come clear to the surface of the water, and glide over it as an aeroplane glides through air. The familiar "skipping stone" progresses in a similar way. In *The Ricochet*, there is a sort of a propeller tunnel extending the full length of the boat, and so dividing the bottom of the hull that the catamaran effect is produced. The rest of the hull bottom is flat and at an angle, thus serving as a hydroplane without the complication of attached planes. The fault of these boats is that they are utterly unseaworthy, and suitable for use only on water surfaces of glassy smoothness.

### Measured Feed and Forced Feed.

Editor THE AUTOMOBILE:

[381.]—In a car that is under my care, the oil is fed to the different bearings by individual pipes from a tank in which an exhaust-gas pressure is maintained. I find that the different bearings are difficult to lubricate equally, and am thinking of fitting one of the lubricators in which the pressure is caused by a pump, as I understand they give better results. I would like to have such information as you can supply me with on this subject, if it is not too much trouble. WILBUR W. STEELE.

Ottawa, Ont.

The difficulty with a lubricator of the type you have is that all of the oil may go to only a part of the bearings. If one of the leads becomes stopped, the pressure will be relieved through the others, and the first evidence of trouble may be a ruined bearing. The best lubricator to use will be one in which there is provision for pumping oil separately into each lead. In this way, the flow of oil to each bearing can be perfectly regulated independently of that to any other. Even though the pumping devices must deliver a considerably quantity of oil at a time, it is better to have a certain quantity delivered regularly at comparatively infrequent intervals than to have small quantities delivered frequently by way of non-positive drip and sight feeds.

### The Few Bad Autoists Cause These Outbursts.

Editor THE AUTOMOBILE:

[382.]—The "Horseheads Reporter" has this to say of that class of autoists who drive their machines pell mell through village streets and along country roads in defiance of the statutes and disregard of the rights of other travelers:

"An automobile passed through the village Tuesday afternoon going at a high rate of speed, and was witnessed by several prominent citizens, including Justice Brown. It was estimated that the machine was going at least 30 miles an hour. The number of the machine could not be ascertained and the occupants were unknown. Such bold and brazen defiance of the law, such usurpation of the rights and privileges of the streets and highways by the owners and operators of automobiles in this locality should be stopped, even if the most drastic measures are necessary. Why allow these people, who have nothing better to do than steer one of these juggernauts about the country, to endanger the lives of all worthy, respectable and law-abiding citizens? If the reckless and unholy automobilists are allowed to continue their devilish practice, no one will be safe while on the streets and highways.

"Let's stop the curs by sending them to jail. They have no concern about their fellows, they have no thought of the sacredness of life. If the whipping-post were in vogue it would be an appropriate punishment for these fiends to give them stripes enough to bring the blood. Your child is not safe on the streets of the village, your wife may be killed while crossing the street to visit a neighbor, you may be struck down while pursuing your business. Stop the damnable practice before it is too late. Stop it now.

"Of the owners and operators of machines who are reasonable and fair no criticism is offered—none is necessary. They have rights which all are bound to respect."

To which the Watkins "Democrat" adds:

"Our esteemed contemporary may be somewhat severe in its strictness, but its complaint is well founded. Right here in Watkins we see the law violated nearly every day by the owners or users of automobiles. It is a common thing to see machines tearing along the principal streets at a 20 or 25-mile clip and the drivers do not let up for anything, no matter what happens. Persons driving horses must get off onto side streets or into the gutters as the flyers dash by. It is the same on country roads—at the sharp blast of the auto horn, which seems to say, 'Clear the track, I am coming,' horsemen rein their animals into the nearest gateway or lane, or even into a fence corner, while a streak of dust rises in the center of the highway and an odor of gasoline floats on the air."

There is more, but it is not worth printing. Driving an automobile on the high-speed gear is no more a "damnable practice" than driving a horse at a trot, although a decent respect for the law is to be entertained. As yet there have been no accidents, and if drivers are careful there will be none.

The "Democrat" is much read by farmers, who are generally hostile to the automobile around here. This article serves to give them the idea that all autoists are like the ones mentioned.

Watkins, N. Y. DOUGLAS G. HARING.

### The Foreign Cars in the A. A. A. Tour.

Editor THE AUTOMOBILE:

[383.]—It is a deplorable fact that the conditions of this year's A. A. A. tour for the Glidden Trophy gave us no result that was worthy of consideration to either a manufacturer, agent, or buyer. The statement by anyone that the American cars made a creditable performance, to the contrary, was not so. I do not wish to depreciate the merits of the winner, or winners, but by comparison to foreign cars the equation is entirely lost. It is apparent to me that the purchaser, to insure safety and consistency in automobile construction, must pay the standard price established by the foreign market; for, eliminating the cars costing more than $4,000 in the Glidden Tour, a technical committee would have been at a loss to know to whom to award the trophy, had there been such a condition surrounding the conclusion of the run. The famous painting of the "Last Roll Call" was not a circumstance to the shattered and disabled condition of the worn-out, battered, and much-abused mechanism that rolled into Bretton Woods, July 28.

This statement I must qualify by saying that early in the contest I stated that the conditions of this year's contest were nothing more than an invitation to wreck a car, and the result fully warrants the statement. Although very much interested, and watching with great concern the products of the American market, there is not a question of doubt in my mind that the foreign cars in their performance during this run gave conclusive evidence that we have much to accomplish in the refinement of detail to compete with the foreign product.

The Darracq made a perfect score under Mr. Stevens's direction. The penalty of 14 points was the result of an error of the guests in the car, owing to the confusion brought about by the changing of the time to be spent at Rouse's Point for the clearance of customs papers, who directed Mr. Stevens to pass the checker 7 minutes ahead of his regular time. Other than this, the Darracq went through with a clear record and completed the run to New York without a single adjustment of any character in the entire time.

The Clement-Bayard suffered its penalization from the delay occasioned from an accident that, had any car in the contest met with similar unlucky circumstances, would have been practically eliminated from proceeding on its journey, which, however, they repaired on the road in time to join the tourists the following day.

It is not consistent to compare any of the contesting cars with that of the performance of the English Daimler, which had been withdrawn at Saratoga at my suggestion, but the work cut out and the performance of all three cars would make it a very dangerous proposition for any owner or maker of an American car to challenge for a similar contest when all conditions were equal. The foreigner, in his engineering construction, must give more attention to greater clearance for our American roads.

The tire question in a contest of this kind is very important, and it was very thoroughly demonstrated that the tires used to-day are almost without exception too small for the load they have to carry and the work to be done. A. W. CHURCH.

New York City.

### A Tip of Interest to Garage Keepers.

Editor THE AUTOMOBILE:

[384.]—It would be a great convenience if you gave in some corner of the paper a list of garages and addresses where out-of-town owners can leave their cars when they come to the city. Very few of us know where to go when we run to town for the day, and in many places a "transient" is not welcome and his car is shoved anywhere and badly used. Many would go to town for the day if sure of some convenient place to leave their car while shopping or calling, a place where they were welcomed and their cars carefully left alone while they themselves were busy.

We don't mind paying if treated courteously and right, but it isn't pleasant to be turned away from several places and finally "allowed" to put up as a great favor, more especially when you have a party of ladies. Can you do something in this line for us suburbanites? CAPT. JOHN J. PHELPS.

Stony Creek, Conn.

# BOOKS OF AUTOMOBILING.

### A New Work on a Subject of Growing Importance.

Codification of the laws governing the operation of vehicles propelled by motors in the various commonwealths has become such an important subject that it is engaging the attention of the best legal authorities, and the latest work on the subject is from the pen of Xenophon P. Huddy, of the New York bar, and entitled "The Law of Automobiles," published by Matthew Bender & Co., Albany, N. Y.

The author and compiler's aim is to give a comprehensive and complete presentation of the common and statutory law governing the operation of motor-driven vehicles in the United States and England, including the reported cases concerning automobiling, and is intended as an authoritative text-book on the subject for the judge and lawyer, and a complete legal guide for all automobilists, automobile clubs, garage keepers, chauffeurs, highway commissioners, and town and county officers.

The status of the automobile is covered by a complete treatment of its position in law, and its comparative relation to other vehicles. The rights of the automobile on public streets and highways is also treated comprehensively, and a large number of cases are cited, with the decisions thereon set out, many of which directly concern the automobilist's rights on the avenues of travel. On the subject of the operation of automobiles, the questions of negligence, law of the road, specific statutory provisions, duties of travelers, duties of pedestrians, duties of animal-drawn carriages, rights and liabilities of parties, speed, etc., are treated comprehensively and in a simple, straightforward manner understandable to the layman. On the matter of evidence and proof of speed, it may be stated that this chapter alone is worth the price of the book, and will prove invaluable to the automobilist, his attorney, and to the court, as well as in deciding disputed questions of speed where there exists conflicting testimony.

The subjects of interstate automobiling, licenses and legislation, the legal aspect of the subject, and a codification of the various state laws, together with the English motor car act, occupy a full two-thirds of the book. The arrangement of the legislative acts is carried out in alphabetical arrangement by states, including the enactments and amendments by the Legislatures of the present year. The whole work is carefully indexed, and presents the most complete compilation of the subject that has yet appeared. It comprises 400 pages, is bound in law buckram, and sells for $3.50.

### A Pleasing Book for Automobilists in General.

"The Happy Motorist" is the pleasantly suggestive title of a new work by Filson Young, the English writer, which discusses all phases of automobiling not comprehended under the title mechanics. In other works the novice can find out why a car has cylinders, or a differential, and how it is made to go; in this particular book he can get an idea of the means of getting the greatest enjoyment out of a car after he has become its possessor. It does not, however, ignore the question of choice, which always presents itself to the convert to motoring, for there are some sensible suggestions about the types and sizes of cars on sale to-day, and what requirements are best suited by any and all. The variety of the little essays in the work is shown by the titles of some of the chapters, which include "The Chauffeur," "The Motor House," "Winter Habits of the Car," "About Driving," "Preparing for the Road," "Equipment," "Routine of the Road," "Accidents and Incidents," and a lot of others. The book is in a very agreeable, "chatty" style, and even if one may not agree with all the views of the author, they are given with such grace and an air of honest conviction that they will never fail to stimulate agreeable reflection in the reader. The book is very nicely gotten out on a peculiar quality of English paper extremely light for its bulk, with uncut edges. It would be a very nice gift to make one's self or a friend who was forming the motor habit. F. A. Stokes Co., of New York, are the American publishers.

### Preliminary Instruction Comprehensively Treated.

Under the title "The Making of an Automobilist," H. A. Grant, M.E., has published a small volume dealing with the construction and operation of gasoline automobiles. The various parts are described and their functions explained. The principal causes of trouble are given and the reader is told how to cope with difficulties when they arise. Special attention is given to tires, and there is also a chapter on winter driving. The book contains 141 pages and many illustrations, and is of convenient pocket size. It can be obtained from the Auto-Instruct Publishing Company, 317 W. Fifty-ninth street, New York City.

## DETROIT'S AUTOISTS SHUN ONTARIO.

Detroit, Mich., August 27.—No longer does Ontario offer any allurements to automobilists from this side of the border. There was a time when hundreds of Detroit enthusiasts invaded the province during the summer months, visiting the numerous resorts along the river and lake front, or taking long drives through the country. But now this practice does not obtain, nor is it difficult to discover the reason therefor. The enactments of the last Ontario parliament, respecting the use of motor vehicles, put a quietus on the sport, and comparatively few machines have crossed the border since the first of July, when the law became operative. A glance at the provisions, a few of the more drastic being given herewith, indicates why automobiling is no longer popular in Ontario.

Markers issued with permit, upon registration with the provincial secretary, must be prominently and securely fixed on both front and back of each machine, the marker on the back to be illuminated by a lamp from dusk to dawn. The marker number must also be painted in black figures not less than two inches in height on the illuminated glass of a lamp to be carried prominently in the front of the automobile, the glass being ground or stippled with white paint. Searchlights are prohibited.

Automobiles must not approach within 100 yards of a horse going in the opposite direction at a speed of more than seven miles an hour, and if going in the same direction the chauffeur must signal his desire to pass and use every reasonable precaution not to frighten the horses. He must stop on signal, and, if requested, render such assistance as may be necessary in holding the horse. In case of accident the person in charge of an automobile must return to the scene and give his name and address. The onus for an accident rests entirely upon the driver of the machine. Furthermore, every peace officer who on reasonable and probable grounds believes an offense has been committed is justified in arresting the person suspected, without a warrant.

## VERMONT IDEAL TOURING IF ROADS IMPROVE.

Burlington, Vt., August 27.—The question of good roads in Vermont has been much agitated of late by press and public all over the state, and it is apparent that both are waking up to a realization that a prominent factor in Vermont's prosperity is permanent roads.

An automobile enthusiast from New York State, speaking particularly of the roads on the western side of the state, makes the following statement: "It is a beautiful country and a delightful place to summer in, but there are many auto tourists who would hesitate to come here because of the roads; whereas, if they were improved to a considerable extent, the influx of summer visitors would soon grow to enormous proportions. It takes so little to make good roads. The material is at hand, and it does not require a very heavy outlay. The people of Vermont are asleep to their opportunities."

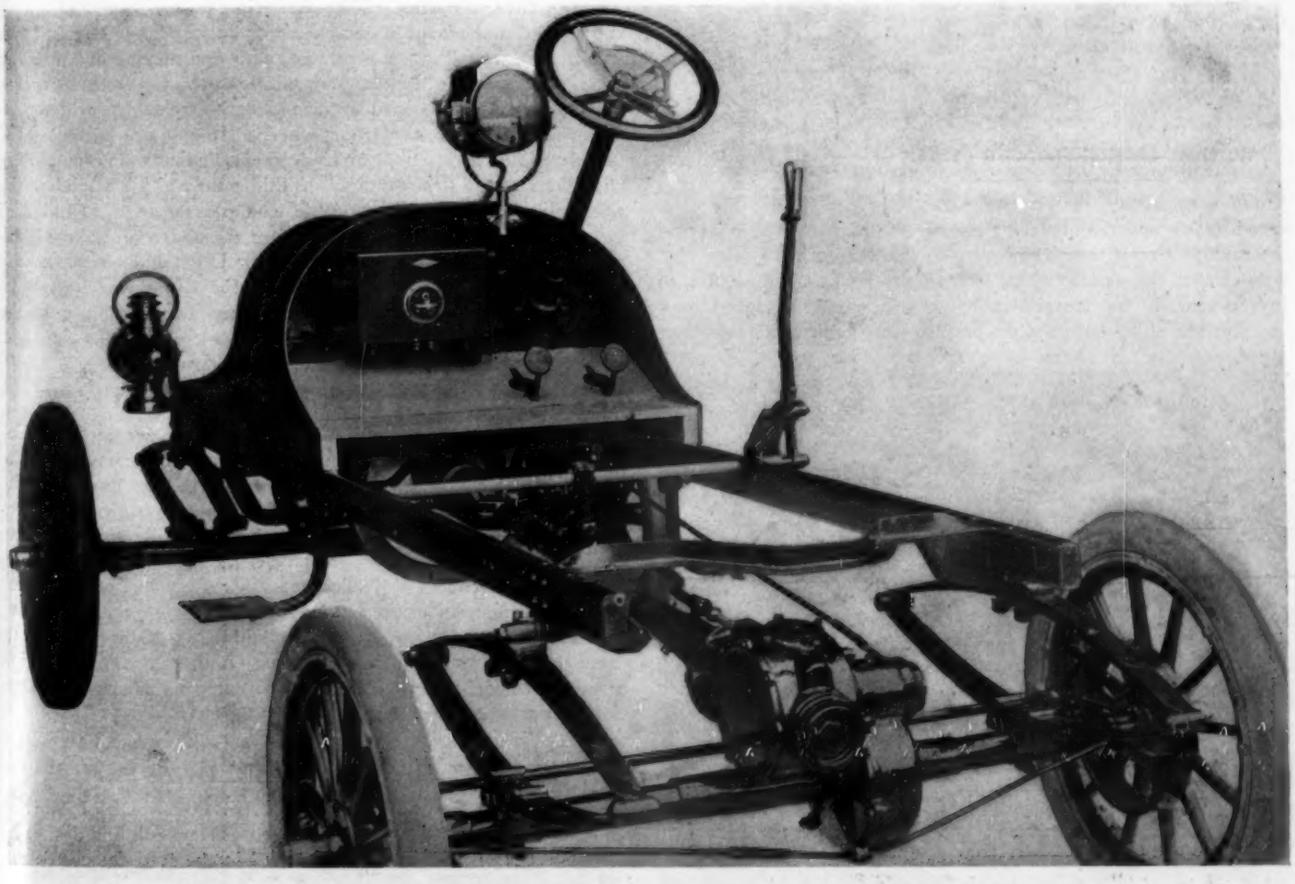
This statement is undoubtedly true, but it is also true that, under the leadership of State Highway Commissioner Gates, Vermont is making marked progress in the direction of improved roads, and the effect of the crusade inaugurated under him by the road commissioners in different parts of the state is already making itself felt. Meetings are being held throughout the state under the auspices of the National Good Roads Association.

# A NEW AND COMPACT CHANGE SPEED GEAR

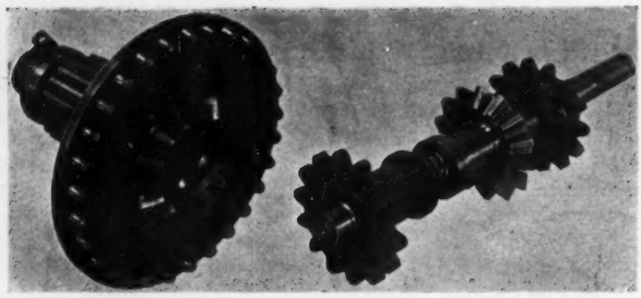
CHANGE-SPEED mechanisms have always been sources of a certain amount loss of power, and the elimination of the friction that, according to fixed laws, accompanies the use of numerous gears, bearings, joints, and so on, has occupied the attention of many engineers since the automobile became a factor in modern life. Vast improvements have been made since the first crude gears rattled and ground themselves to pieces, but still efforts are being made to avoid unnecessary friction. The change-speed gear here illustrated, the Hassler transmission, for use with propeller shaft drive, made by the Marion Motor Car Company, of Indianapolis, Ind., concentrates the change-speed mechanism, the bevel driving gears and the differential in a single housing on the rear axle. Four gear positions are obtainable by a single progressive lever—reverse, neutral, low speed and high speed. The drive is from pinions on the rear end of the propeller shaft to gears carried by a short countershaft at right angles to the propeller shaft and parallel to the axle, which also carries a spur pinion meshing directly with the spur-driving gear on the differential casing. An important feature of the device is that there are but two transferences of power between the engine and the driving wheels—from the propeller shaft to the countershaft, and from the countershaft to the differential on the rear axle. This is true whether the reverse, the low gear or the high gear is engaged. With regard to the fact that there is not a direct drive on the high speed, the manufacturers state that this is more than compensated for by the absence of angularity in the propeller shaft, for, with the Hassler transmission, the engine may be placed on a horizontal plane with its shaft 5 1-4 inches higher than the center of the rear axle, and yet have the engine shaft and propeller shaft directly in line. It is, of course, necessary to provide a single universal joint to allow for the vertical movement of the engine with relation to the rear axle; but the power lost in this way is stated to be insignificant.

As the illustrations show, the transmission consists of three pinions on the rear end of the propeller shaft, two being slidable on the shaft, and two gears mounted on a common disk carried on the countershaft with spur-driving pinion. Of the gears on the disk, one, the smaller, is of the ordinary bevel type, with large, strong teeth, and the other, occupying a circle near the periphery of the disk, consisting of a ring of steel pins, with rounded ends. Of the three pinions on the propeller shaft, two are spurs so formed as to mesh with the pins on the disk, and the one between these is a bevel, always in mesh with the bevel on the disk.

Changes of speed are brought about as follows. For the low speed the forward pinion on the propeller shaft is slid into engagement with the pin-gear on the disk, driving the car forward with a double reduction. For the reverse, the low-speed pinion is slid forward out of engagement with the pins, and its twin pinion is slid into mesh with the pin-gear on the opposite side of the disk, which is thus caused to rotate in the opposite direction, driving the car backward at the same rate as the slow speed forward. Both these pinions are prevented from rotating on their shafts by Woodruff keys, but are free to slide longitudinally. The middle bevel pinion, however, is not keyed to the shaft, but is free to rotate on it, and is at all times in mesh with the corresponding pinion on the disk, rotating idly when the pin-gears are driving. The high-speed drive through the bevels is engaged



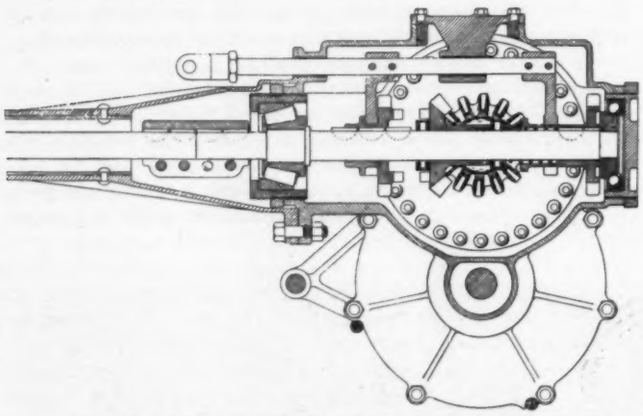
HASSLER TWO-SPEED TRANSMISSION IN CASING ON LIVE REAR AXLE FOR PROPELLER SHAFT DRIVE.



COUNTERSHAFT AND GEARS OF THE HASSLER TRANSMISSION.

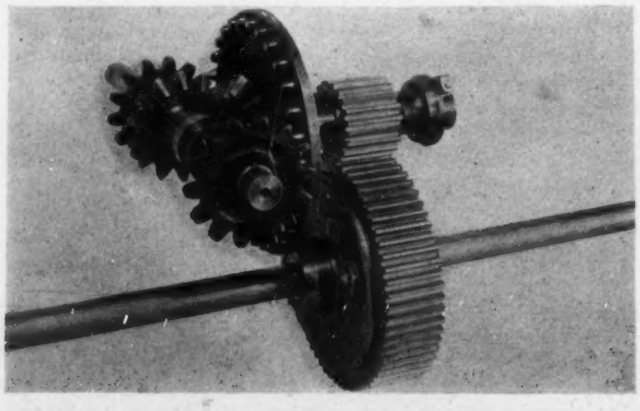
by sliding the low-speed pinion toward the bevel until the teeth of a claw clutch, half of which is formed in the hub of the bevel and the corresponding half in the hub of the sliding pinion, interlock. Both pin-gears being free, the bevels take up the drive, and there is now but a single reduction of speed, from the countershaft spur pinion to the driven gear on the differential casing. Collars pinned to the propeller shaft prevent the bevel pinion from changing its position longitudinally.

These changes of gear position are obtained through a sliding rod, carried above and parallel with the sliding-gear shaft, on



VERTICAL SECTION THROUGH CENTER OF PROPELLER SHAFT.

which are rigidly secured two forks, one for sliding the low-speed pinion and the other for the reverse pinion. The collar on the reverse pinion slides, however, on the longitudinally-extended hub, so that the pinion, which is normally held out of mesh with its pin-gear, is not moved while the shifter-rad is moved back and forth to shift the other pinion into neutral position, into low-speed position, or clutch it to the bevel for the high speed. When, however, the controlling lever is shifted so far as to slide the low-speed pinion beyond the neutral position, the collar on the reverse pinion hub comes up against a flange at the end of the hub and slides the pinion against the pressure of the spring into engagement for the reverse. The spring, of course, brings the reverse pinion back to its normal "out" position when the hand lever is released.



PARTS OF TRANSMISSION ASSEMBLED WITH DIFFERENTIAL.

Noiselessness on the low gear is a strong point claimed for this transmission, the manufacturers stating that it runs with absolute smoothness and silence, thus removing a common objection to running on the low gear for long periods. The efficiency attributed to the gear is also responsible for the fact that the low gear is unusually high—about half the speed of the high gear. A considerable range of gear ratios can be supplied, but the ratio between high and low is practically the same in all cases. The absence of an intermediate gear is attributed to the practicability of using a fast low gear.

Owing to the placing of the parts above the axle, the road clearance, with 30-inch road wheels, is 10 1-4 inches, and with 32-inch wheels 11 1-4 inches.

The Marion Motor Car Company is fitting this transmission to its own cars, and offers it for sale to other automobile builders. The Hassler gear is made in sizes suitable for cars from 10 horsepower to 24 horsepower.

## MR. BECKLEY'S PERSISTENCE WINS OUT.

BENTON HARBOR, MICH., Aug. 27.—For several years Edward E. Beckley, manager of the Pioneer Automobile Company, of this city, has been fighting for the widening of Church street, a narrow street, the land for which was originally given by the First Baptist Church Society, with the understanding that the board of education would some day give a strip off the school lot to make the street the average width. For twenty years the matter has been threshed out periodically, and one time the proposition to widen the street was defeated at an election. Two years ago Mr. Beckley found that the street was too narrow to allow an automobile to pass a horse and wagon and he began an aggressive campaign. Time after time he has appeared before the council and school board but apparently without effect. Two weeks ago, however, he won out with the school board, as it voted to donate the ten-foot strip above noted for street purposes when it should be decided to pave Church street.

Citizens of Benton Harbor and St. Joseph are alive to the advantages of good roads and pavements, now that automobiling has taken such a firm foothold on this community. Together the cities number about 15,000 people, and possess over 20 miles of good pavements, and the drives along the shore of Lake Michigan, into the fruit country, to Paw Paw Lake, and other summer resorts, are all that could be asked for. One year ago Mr. Beckley's auto was the only bug buzzing around, but now the automobiles number nearly fifty.

## SEATTLE IS A PROGRESSIVE AUTO CITY.

SEATTLE, WASH., August 25.—H. B. Rector, formerly of Columbus, O., has become president and general manager of the Northwest Motor Company. Associated with Mr. Rector in the business is F. R. Caldwell, who holds the dual position of secretary and treasurer. In spite of its hills, Mr. Rector considers Seattle one of the most progressive cities in an automobile way in the United States. Headquarters for the Northwest Motor Company have been secured at Broadway and Union street, where it has erected a fine garage. The building is of brick and patterned after the most up-to-date ideas. A thorough investigation of advanced plans were studied. The company is devoting special attention to the White steamer.

## VERMONT HAS REGISTERED 766 AUTOS.

The Vermont Secretary of State, F. G. Fleetwood, of Morrisville, has granted this year 266 licenses for automobiles. The total number of machines now licensed in the state is 766.

"THE FOLIAGE SEPARATES AND BECOMES A GATEWAY TO THE LAKE."

FACING the opaline iridescence of a morning sky that has not enough of one color or another in its milky brilliance to portend rain or suggest extreme heat, we leaned against blue Packard "Thirty" or fussed over its already well prepared detail, as the tired ferry made for Canada and an open highway that would lead us from Detroit to Gotham.

More disgruntled than alert, a couple of Canadian customs officials ask for our papers and of our purpose; turn a blind eye to the one and a deaf ear to the other, and officialize the entrance into Ontario with a weary wave of the hand. The trip register of the odometer is turned to zero; the spark connection is turned onto the magneto; there is a hasty glimpse at the luggage strapped on the rumble seat behind; the clutch, free of its leash slips into engagement, and the big runabout leaves unawakened Windsor for the wide country, that is already up and doing with the affairs of farming.

It is five-fifty now, and, while the sun is well above the low wall of trees that bound the east, there is yet no sign of the day, except that it will trifle with rain clouds and torment with a broiling heat. One must expect this sort of weather in sultry August, and we were somewhat prepared to accept whatever the day brought forth as the clock moved round.

South and east the road stretches and winds and bends. It is macadam of an unkept kind, or gravel or dirt. Level enough and easy to follow, it is neither attractive nor fast, and the farm houses along its uncertain edges speak of struggle rather than of prosperity. Yet we start our 800 miles with alacrity, laugh at the crumbling ruts of clay or disintegrated, wasting stone and careen along at forty-five miles the hour.

Russell Huff, designer of this '07 Packard—bigger and more speed-daring than any of its forebears—grumbles at the way a bit, then presses on the foot accelerator, perhaps in spite; perhaps to show me that his pet has no fear of roughened going. Then the dancing hand on the speed-meter jumps ahead in its wavering and does its little jig over the figure "60."

### Canadians Are Familiar with Their Auto Law.

The country is wide awake out here, and a raised hand, far down the road, means that the industrious bucolic Canuck knows "ye auto law." The car is stopped at the roadside, and a white horse, of doubtful pedigree and still more doubtful age, scampers past with the artful coquettishness of an old maid. Huff and myself both instinctively turn to the driver inquisitively, but instead of the expected rebuke there is a rare smile of friendliness. A quarter of a mile more and the incident is repeated. Twice or thrice a mile it repeats thereafter, until the morning wears on past breakfast hour well into the heat of the day.

Never were there so many farm rigs on a road together as on this first Saturday of August, as we headed eastward bent on reaching Buffalo that night. A county fair or a circus could not have drawn a steadier stream of vehicles onto the highway, nor could these rural drivers have been more uniformly and consistently afraid that their horses would take to jumping fences and climbing trees at our approach. Yet, strangest of all, during that whole morning of intermittent scorching and stopping, and that whole day of 297 miles across Ontario for the length of the "Governor's road," was there a single snarl, or objection, or protest to our equal use of the road. Interrupted our flight, as that of a street car in a crowded town, we still made good time, and not many miles did it take to drive the drowsiness of early day from our eyes and exhilarate our every fiber.

Maidstone Cross, Essex Center, Olinda, Ruthven—one much like another—the Canadian towns swept rearward. Each of these towns possessed a main street through which the road led straight ahead, and along which creeping vines hid the nakedness of unpainted houses that bespoke age rather than thrift.

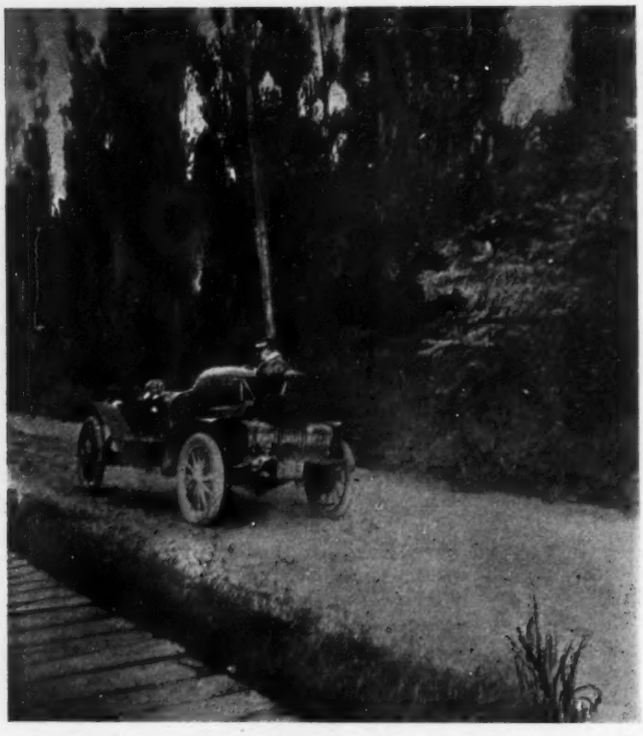
The road becomes better or worse. Sometimes hard and fairly smooth; then soft or sandy. Ever it leads a dead, winding, yellow river of peace—a more potent line of travel across a peaceful country than the steel ribbons it occasionally crosses. The countryside itself improves, however, and the apparent poorness of western Canada gradually is lost in a greater scenic charm and a more voluptuous soil. At some right angle turn the road, of a sudden, companions a somewhat rusted, grass-grown rail course whose wire above denotes the interurban trolley. The mounted police may yet rule the far Northwest, but the Canada we know the best has an automobile factory, and the farmer may visit his relatives via electric railway. Some day, perhaps, America—both Canada and the United States—will learn the real lesson of traffic progress and build highways worthy of their steeds.

### Characteristics of Ontario's Cities and Towns.

For a distance the road rises a few feet to the mile, and from occasional crests there is a wide perspective of fertile land and rich, green verdure—some of it the planting of nature and some the transplanting of man. Low, thick bushes, such as those in which lurk the bandit of the thrilling novellette, ambush the highway. It seems to touch the illimitable sky, and in it end. Then, just as we strike the sudden angle of the trail, the foliage separates and becomes a gateway to the lake. Almost silvery in its glassy greenness, it softly laps the bank of clay and sand below us, and does not even hint that it is slipping on to break into uproar at Niagara.

We glance and scoot away. For the road is good here and there are no teams in sight. We can run the little tell-tale up to sixty and improve the "average."

We hardly knew it when we ran into London. Despite its name and its certain importance among Canadian towns, it is a quiet place, and so used were we to going through towns with scarcely any other token of their being than the barking of a dog or the cry of a small boy, that our sudden advent in the midst of Saturday afternoon activity in congested streets startled us about as much as it did the residents.



"MORE POTENT LINE OF TRAVEL THAN STEEL RIBBONS IT CROSSES."

We were thirsty and hungry, for it was nearly noon, and we had breakfasted before sunrise at an all-night lunch counter in Detroit. We found a small garage, where we learned that Canadian gallons of gasoline are 25 per cent. larger, but cost 50 per cent. more than do American gallons. We alternated tank-filling with question-answering—those sociable Londonites talk naturally in interrogation points.

Lunch was hurried, and to the strains of the local band—very English in its uniform, its military step, and its music. A "bobby," who might have been imported direct from the parent London, saluted as we got once more into the car, told us that the Governor's road stretched on eastward to Hamilton, and said there would be no trouble with speed laws.

The small towns became more frequent now and not so small; the road remained about the same. Evidently the "governor" who built it either died or lost interest in it, and it has not been kept in the repair that its original worth justified. After awhile the country again settled into that leveler quiet and laxity that marked the western portion, but in the vicinity of Hamilton it became, not only again beautiful and fresh, but even luxuriant. Hills were steeper and oftener. Trees grew thicker and greener. There was nothing faded anywhere. Fruit of the hardy varieties was everywhere, even along the roadside. It was a country of plenty.

In Hamilton the excitement of market day was done. Farmers walked the streets waiting for sunset before starting their equally easy-going horses homeward. Empty wagons by the score told that the townspeople had purchased with no penurious hand. On the green a game of cricket enthused a thousand into a cordial "Well hit, sir; well hit!" as we passed.

Then it was country again. There was little traffic now, and, mile after mile, we pushed ahead with the dust of the worn macadam rolling up and following us in its futile race to catch us.

**The Approach to Niagara Falls from the Westward.**

We ran into a lane of trees and flowers and hedges, where the road was almost a boulevard, and where electric incandescents were tied to the sky in an irregular line above the road. The houses were of brick and worth while. The owners and their friends and enemies were clothed in white, and they croqueted or coquetted. We thought it to be Grimsby, and an unusually attenuated village. We stopped a sturdy, broad-shouldered, pink-faced young American-Briton, and, to our inquiry, he said this was Grimsby road, and the town was miles ahead. These playing, white-clothed country residents, then, were fruit growers, agriculturists, farmers. We were sorry we were hurrying.

Twilight passed us, and, looking back at her, the sky rose above the now almost black tree line, a vast panorama of red and purple and gold, one color after another on up to the gray night settling quietly.

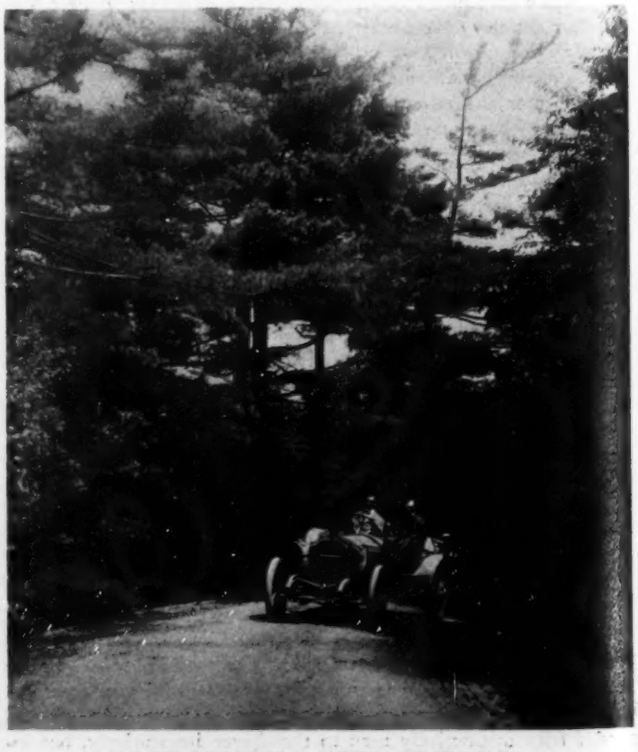
Now we were looking for Niagara Falls. We found St. Catharines, and were disappointed when we were told we were still fourteen miles from the "Falls," and confused when a dozen "authorities" wrangled over that never-settled problem—the best road. We listened to it all, judged for ourselves, and started on via St. Davids. This is a little "four-corners," with houses of all kinds trailing off into the country in all directions. The "limits" are nowhere discernible. It was dark now, and we drove through a tunnel of trees that soon ended in a tunnel of rock where the road extends under a railway embankment a hundred yards wide.

Soon over at the left a line of stars, almost on the ground, told of our approach to the Falls, and on a good road we ran under new acceleration straight to the Grand Trunk bridge.

**Along the Feeder of the Great Cataract into Buffalo.**

A Canadian customs official glanced at our papers and referred us to Uncle Sam at the other end of the bridge. Here we were forced to parley, for while we were well fixed with authority to take this Detroit-made American car of ours into Canada, we had nothing by means of which to get it back into the United States—except talk—and in that way we managed it. Even the Canadian official at this end of the bridge grinned, and agreed that Canada was *not yet* building "such cars as this" and exporting them to the United States. However, he had pride enough to add: "but soon."

Covered with dust and mud that we had splashed up in wet places, without hats, and not caring much about washing just then, we shied at the more elaborate eating places, and heeded not the wiles of the meal spielers with which over-restauranted



"DROVE THROUGH A TUNNEL OF TREES."

Niagara abounds. Instead, we sought a quiet retreat, where we were more entertained than fed.

Southward along the trolley that brings multitudes of tourists from Buffalo for the one grand sight of their lives, we took up the running of the last lap into Buffalo. At a place where the road goes under the track, we started up the trestle with the latter, saw our mistake in time, backed down, and went on again as fast as the rather dark evening and the unlighted road would permit in safety.

"HILLS WERE STEEPER AND OFTENER."

Through one town and then in among the lumber piles and docks of another, we knew that Tonawanda was reached and we would soon be on Buffalo's famous brick road. We also knew that there were stringent speed laws in and about Buffalo, but the whirring bricks tempted, and there was no speed law for us. Into the park and onto the politer asphalt of Delaware avenue another car gave us race, but only was fast enough to shout greeting of the night and drop back into obscurity. We slowed to pass another car on a corner, saw a man run out behind it, and note its number, sped on to the region of more light and traffic and less speed, and suddenly shot into Main street. In a minute we were at the garage, and then in a few minutes more at the hotel and in bed.

(*To be concluded.*)

## DIRECT AND INDIRECT HIGH GEAR.

So much has been claimed for a direct drive, so-called, on top speed, and so many makers of motor cars have adopted this arrangement, that it has come to be generally looked upon as a *sine qua non* of an up-to-date car. It is very doubtful, however, if even the keenest partisans of this "direct drive" appreciate its disadvantages or fully realize the value of the claims that can be put forward on behalf of an indirect top.

With the now almost universal adoption of the vertical engine set under a bonnet in front of the car, a truly direct drive is, of course, impossible; for this term, to be absolutely correct, the crankshaft itself would need to form the driving axle. This, of course, is manifestly impracticable with the engine speeds now found to be most efficient. As it is, we have on the one hand an engine whose nominal speed of revolution may be anything from 900 to 1,000 revolutions per minute—say a mean of 1,200. On the other we have road wheels of 30 in. to 36 in. diameter, and these have to be geared to give, with nominal engine speed, say 30 miles per hour. This means the road wheels must make 296 revolutions per minute, or the engine must be geared to the road wheels through a reduction of 4 to 1. This, in the case of smaller engines and lower car speeds, may easily rise to 5, and even 5 1-2 to 1. To speak of such an arrangement as a "direct drive" is surely a misuse of terms, says *The Motor World*, of Glasgow, Scotland.

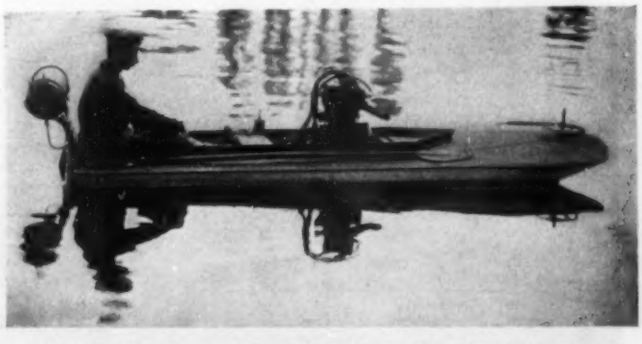
In the case of cars having a large axle and bevel drive—now the most popular type—the whole reduction must be made between the bevel pinion and its wheels. While even as great a rate as 6 to 1 is practicable in a bevel drive, yet such a ratio cannot be recommended. In fact, many of the difficulties associated with bevel drives are really due to the large-velocity ratios employed. A very small pinion meshing with a large wheel throws heavy stress on the pinion teeth, and excessive wear is probable owing to the small number of teeth in mesh at one time. Again, the forces tending to throw the wheel apart and out of alignment increase with the velocity ratio of the gears; while as the size of the pinion decreases it becomes more and more difficult to support it properly, as it should be, on each side, owing to lack of space. As a result small spindles have to be used, and bearings of insufficient dimensions to take the thrusts have to be resorted to.

Experiment shows that every conversion of motion occasions loss of power, and that the efficiency of the conversion depends largely on the velocity ratio; so that, while a pair of miter wheels (bevels of equal size) may have as large efficiency as 90 per cent. to 94 per cent., yet when the wheel becomes four to five times the size of the pinion the efficiency falls to about 80-85 per cent. Now with spur gear even better efficiencies are obtained than with miters, and it becomes a question of whether, after all, it is not better and more efficient to employ an indirect top speed in the gearbox, doing the first part of the speed reduction there. The use of ball bearings with well-cut wheels running in oil assures a large efficiency for this conversion; while the bevel drive being now more nearly equal, therefore more efficient, can be much better designed, and the pinion teeth do not get so much to do, consequently wearing longer. The whole arrangement may give a slightly more noisy gearbox, but it insures a much quieter back axle and one that is at the same time more efficient and far less likely to give trouble.

A further incidental advantage is that the bevel wheel may with this arrangement be kept smaller, thus permitting of greater clearance above the ground—a most valuable feature, more especially in cars intended for use in the colonies.

## A DIMINUTIVE MARINE FLYER.

Remarkable speed is said to have been attained by the curious looking French motor boat shown in the accompanying engraving. The boat belongs to a type with which a good deal of experimenting is being carried on at the present time—the gliding boat, designed to run over the water, rather than through it. Though only 10 feet long, 37 inches wide and propelled by a 9-horsepower two-cylinder air cooled motor, the little boat is credited with a speed of 35 miles an hour. The rudder is placed in front and is controlled by ropes brought along the deck to



FRENCH MOTOR BOAT CREDITED WITH 35 MILES AN HOUR.

the helmsman's seat in the extreme stern. This speed is all the more remarkable on account of the extreme shortness of the little racer. If the report of the performance of the *Nautilus*, as the boat is called, is confirmed by later advices, doubtless the gliding type of boat will receive a strong impetus. It would be extremely interesting, however, to know how a boat of this type would act in rough water, when the waves would doubtless interfere with the gliding action, the secret of the craft's speed.

ON THE ROAD ACROSS THE MOJAVE DESERT, EIGHTY MILES WEST OF LOS ANGELES.

## AUTO RACE ABOVE THE CLOUDS.

Los Angeles, Cal., August 22.—The true Californian is nothing if not a true sportsman, and he is ready to back his argument at all times with a trial of his skill with the machine he drives, provided he is an automobilist, and to back the car itself to the extent of his pocketbook if necessary. As a result of this disposition on the part of two residents of this locality, a White steamer and a Reo gasoline car will race above the clouds on August 25. Starting from Los Angeles, the cars will dash through the pretty San Fernandino valley, over the dreaded Newhall grade, across the Mojave desert, and up the mountain known as "Old Baldy," to an altitude of 7,000 feet.

A challenge issued by F. C. Fenner, a wealthy Southern California mine owner, started the trouble. Mr. Fenner has a mine on "Old Baldy," and has been making the trip in his White from this city for the last fifteen months. Recently he returned over the 100-mile course in five hours, and said he would like to race any car in Los Angeles to the mine. His best time on the upward trip was 6 hours and 20 minutes. L. T. Shettler, the local Reo agent, accepted the challenge, and, after an interchange of letters, they agreed to wager $500 on the result. The cars can be stripped or geared in any manner desired.

From Los Angeles the road leads through a fertile valley, but after a heavy climb the desert country is encountered, and then come several climbs with a rise of 3,000 feet in three miles. The last mile is over a road, rough, narrow, and full of turns and twists. The race has awakened much interest in automobiling circles here, and the result is awaited impatiently by the enthusiasts.

## THE ORMOND OF THE PACIFIC COAST.

Pizmo, Cal., August 22.—Among the Pacific Coast winter events in the California automobile world will be an endurance run to Pizmo Beach from Los Angeles, and in all probability a similar run from San Francisco and Fresno, with a race meeting as a fitting terminal on the broad sands at this resort. Efforts are now being made to secure several fast cars to try out the beach for fast trial work, in order to demonstrate that the course is all that is claimed for it. Up to the present time only stock cars have performed on the hard stretch of sand.

By bridging a small creek, which empties into the Pacific part way of the beach, there is a stretch of sixteen miles in length for racing. At present the stretch from the creek to the finish, near the hotel, is a little over three miles. The sand is hard, being packed daily by the tides, and experts who have examined the course say racing machines should be able to make phenomenal time.

Pizmo is the natural second day's stop between Los Angeles and San Francisco, starting from the former city, and an average of five cars make the place each day. From Los Angeles touring parties stop the first night at Santa Barbara, after a run of 113 miles over two mountain ranges. The second night stop is at Pizmo, the third, Monterey or San Juan, and then into San Francisco.

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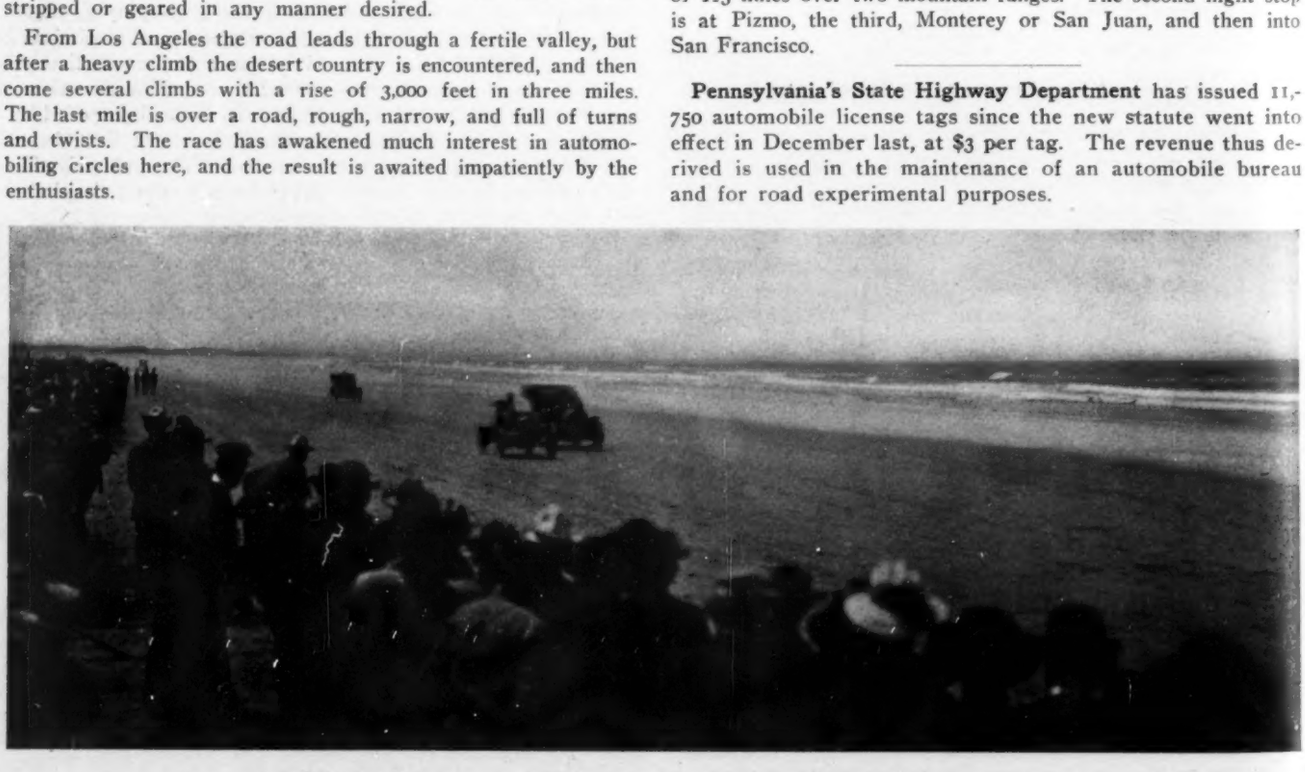
**Pennsylvania's State Highway Department** has issued 11,750 automobile license tags since the new statute went into effect in December last, at $3 per tag. The revenue thus derived is used in the maintenance of an automobile bureau and for road experimental purposes.



STOCK CARS RACING ON THE SMOOTH STRETCH OF OCEAN FRONT AT PIZMO BEACH, CAL.

# EARLY AUTUMN DAYS AMONG THE CLUBS

### Illinois State Association Holds Its Annual Meeting.

CHICAGO, August 27.—At the annual meeting of the Illinois State Automobile Association, which is the state branch of American Automobile Association, held last week in this city, the following board of directors was elected for the ensuing year: John Farson, Sidney S. Gorham, Ira M. Cobe and Joseph F. Gunther, of the Chicago Automobile Club; Joseph H. Francis, Austin Automobile Club; Samuel P. Irwin, Bloomington Automobile Club; George W. Erhart, Decatur Automobile Club; C. H. Cobb, Kankakee Automobile Club; A. J. Olson, McHenry County Automobile Club; R. A. Whitney, Peoria Automobile Club; G. K. Barnes, Rockford Automobile Club.

The state association during the first year of its existence has made satisfactory progress, and now comprises among its membership the Austin, Bloomington, Chicago, Decatur, Kankakee, McHenry County, Peoria, Rockford and Springfield Automobile clubs and a considerable individual membership which represents practically every section of the state of Illinois. During the past year much of the time of the officers of the association has been occupied in organization work. Plans for the erection of sign boards in almost every section of the state have been formulated, and an active campaign in favor of good roads and of the enactment of a law governing the use and speed of automobiles having general application throughout the state, will soon be inaugurated. It is the hope of the officers and directors of the state association that at the next session of the legislature a substantial appropriation will be made for the improvement of the roads of the state, and it is the purpose of the association to actively advocate and work for the enactment of such a law.

The Chicago Automobile Club has scheduled a club run to Algonquin, Ill., September 5, to attend the hill climb conducted by the Chicago Automobile Trade Association, September 6. The tour is scheduled to start from the fountain on the south drive in Garfield Park at 4 o'clock on the afternoon of September 5, stop over night at Elgin, and proceed to Algonquin in the morning.

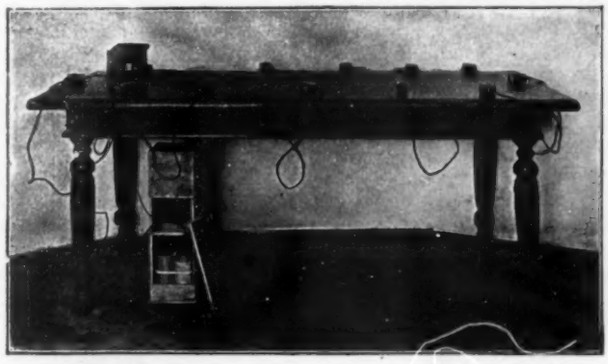
### New Jersey A. and M. C. Open New Clubhouse September 15.

NEWARK, N. J., August 27.—It was originally intended to hold the formal opening of the new clubhouse of the New Jersey Automobile and Motor Club, at Broad and Chestnut streets, this city, at the close of the club's race meet on the afternoon of Labor Day, but as the Weequahic Park program will be a long one, and everybody will be tired out after the day's sport, the opening of the clubhouse has been postponed till Saturday, September 15. The plan is to hold a big automobile parade on the afternoon of that day, which will finish with a grand flourish at the new clubhouse. As now outlined, the route will lead through the Branch Brook Park and Park avenue, as well as through the central part of the city, and the Essex County Park Commission has signified its willingness to have the parkways watered to keep the dust down to a minimum for the occasion. At the present date no official action has been taken on the above program, but it has the indorsement of Joseph H. Wood, president of the club; Horace A. Bonnell, the secretary, and W. I. Fisk, the chairman of the house committee, who has charge of all club runs. Frederick R. Pratt, president of the Associated Automobile Clubs of New Jersey, also thinks well of the idea and will support it. With such men in its favor, the parade should be a great success and should serve to draw a large body of motorists to the opening of the clubhouse after the run, which by this time will be completed, and all will be spick and span for the reception of the clans of motordom.

The club intends to have a busy winter, and the committee which will arrange a program of events has various ideas under consideration for the entertainment and instruction of members.

### An Ingenious Electrical Voting Device for the A. C. A.

NEW YORK, August 27.—Where many applications for membership are to be voted upon by clubs, some better and more rapid system than the customary ballot boxes, with which white and black balls are used, is desirable. Not only is the box and ball system somewhat laborious, but unless special care is taken the entire secrecy of the ballot is not assured. Dr. Schuyler Skaats



ELECTRICAL BALLOT MACHINE READY FOR SERVICE.

Wheeler, chairman of the building committee, of the Automobile Club of America, also president of the American Institute of Electrical Engineers, has recently devised an ingenious electrical voting machine for the use of the club.

As shown in Figure 1, it is arranged at a table, around which the board of directors or other voters are seated, and consists of an ordinary two-drop annunciator. On each of the pushes arranged around the table there is a little white button on the side and a black button on the end, the former operating the white drop and the black button the drop on which the black circle is shown. If any one of the black buttons is pushed the black drop will fall, but if white buttons only are pressed the white drops will only come down. In operating, the shield of the annunciator is lowered to cover its face, and all votes can be cast at the same instant. On raising the shield the result is known.

READY FOR REMOVAL.

The case consists of three compartments, in the lower one of which the batteries are located. When packed for carrying or storage (see Figure 2), the annunciator is in the middle compartment, and the cord and pushes on the top.

### Missourians Celebrate Opening of Park Drive.

KANSAS CITY, August 25.—More than 100 motor cars participated in the Kansas City Automobile Club's parade on the Cliff Drive, one of the finest parks in that city, on the evening of August 22. On this date motorists were, for the first time, under an ordinance passed two days previously by the city council, permitted to use the drive. A complete tour of the park was made, after which the parade continued through the downtown streets. President W. W. Cowen, of the club, in a Welch driven by E. L. Decamp, led the line. With him was Alderman Havens, leader

of the majority party in the council, an advocate of the motor car. Other city officials were also on the trip. The drive will be open to motorists each Wednesday. The opening of the drive was fought for by the club, and it is due to their efforts that success finally came.

Next winter the club will make a campaign for the repeal of the obnoxious section of the state law, which requires a license fee of $2 for each county through which a car passes.

The Kansas City Automobile Club has fixed September 12 as the date of its endurance run, which is to be patterned closely after the Glidden tour, being run under practically the same rules. The run will be from Kansas City, starting at Van Horn road and Grand avenue via Martin City, Mo., Olathe, Kan., and Spring Hill, Kan., to Paola, Kan., where a dinner stop of one hour will be made. The return will be via Spring Hill, Olathe and Merriam, Kan., to Kansas City. The running time for the distance is fixed at eight hours for the 104 miles, which would be 13 miles to the hour. Checking stations will be at Olathe, Paola and Kansas City. Part of the route was laid in Kansas, for the reason that, should the motorists venture from one Missouri county into another, they would be subject to an extra license fee of $2 each time they cross a county line. Twenty-five miles of the route is macadam, the other dirt roads. The contest is limited to members of the club.

### Nashville Autoists Will Build a Country Clubhouse.

NASHVILLE, TENN., August 27.—Enthusiasm is being manifested here over the project of the Nashville Automobile Club to build a country clubhouse, and at the coming annual meeting of the club the scheme will take a definite outline. The club members behind the project are now engaged in looking up a fine location on one of the popular thoroughfares of the county and obtaining estimates of the cost of construction.

Something new for this section of the country was inaugurated during the recent Callatin fair, in Sumner county, some thirty-five miles from Nashville. A procession of thirty-five automobiles started from this city to visit the fair on "Nashville Day," and preserved a strict line of march all the distance to the fair grounds. The local club had charge of the arrangements, and the program was admirably carried out, the spectacle creating a sensation among the country folks who lined the route. Duncan R. Dorris led the procession in his touring car.

### A. C. of California Holds Club Meeting at Del Monte.

SAN FRANCISCO, August 22.—After three days of touring, during which time several hundreds of miles were traversed, the members of the Automobile Club of California have returned to their homes from the club meet at Del Monte. From this city and vicinity the turnout to the run numbered over 200 cars. San Jose contributed twenty-five cars, and a number of the smaller cities a lesser number. A general meeting of the club was held in the big ballroom of the Hotel Del Monte, and a series of gymkhana events was successful carried out on the Del Monte race course.

## CLUB DOINGS IN GENERAL.

LAKE GENEVA, ILL.—Automobilists of this place have written to Secretary Gorham, of the American Automobile Association, for suggestions for the drawing up of a constitution and by-laws for adoption by the Country Automobile Club, which is now in process of organization here. Many of the members of the new club are also members of the Chicago Automobile Club.

NEW YORK.—As an auspicious opening of the fall season of runs, the one conducted by the New York Motor Club, August 22, embraced all the elements of a perfect success. Nearly 100 members of the club in twenty-five cars left headquarters at the Hotel Cumberland at half-past five in the afternoon, and headed for Blossom Heath Inn, Larchmont, where a shore dinner was eaten in the big dining room.

MONTREAL, CAN.—The Automobile Club of Montreal, which is the leading club in the province, is greatly interested in having its members comply strictly with the recently-enacted automobile law, although the law is considered as rather stringent. A circular has been issued to every member, advising them of the terms of the law, and counseling a strict observance of the statute as the best means to obtain public favor and a modification of objectionable features. The present condition of the streets of Montreal does not favor fast driving, so there is little danger of exceeding the speed limit until the suburbs or open country are reached.

## THE AUTOMOBILE CALENDAR.

### AMERICAN.

#### Shows.

Sept. 22-29.....—First National Automobile Parts Show, First Regiment Armory, Chicago; A. M. Andrews, Secretary, 184 La Salle street, Chicago.
Dec. 1-8.....—Seventh Annual Automobile Show of the Automobile Club of America, Grand Central Palace, New York City, under the patronage of the American Motor Car Manufacturers' Association.
Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.

#### Tours.

Sept. 15.....—100 Mile Endurance Run, Kansas City (Mo.) Automobile Club.
Sept.....—500-mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)
Oct. 1-2.....—St. Louis, Mo., Automobile Parade and Carnival, St. Louis Automobile Club.
Oct. 20.....—Philadelphia, Pa., Cross Country Run of the Philadelphia Automobile Club.

#### Race Meets and Hill Climbs.

Sept. 3-4-5.....—Fall Race Meet of the Atlantic City Automobile Club, Atlantic City, N. J.
Sept. 3.....—Race Meet, New Jersey Automobile and Motor Club, Weequahic Park, Waverley, N. J.
Sept. 3.....—Topeka, Kan., Race Meet of Topeka Motor Car League.
Sept. 3.....—St. Louis Fair Association Track Races.
Sept. 6.....—Hill Climb, Algonquin, Ill., Chicago Automobile Trade Association.
Sept. 22.....—American Elimination Trials for Vanderbilt Cup Race. (Long Island Course probably.)
Oct. 6.....—Vanderbilt Cup Race, American Automobile Association.

#### Motor Boat Races.

Sept. 10-15.....—National Motor Boat Carnival, Hudson River, New York City. Under the auspices of the Motor Boat Club of America.

### FOREIGN.

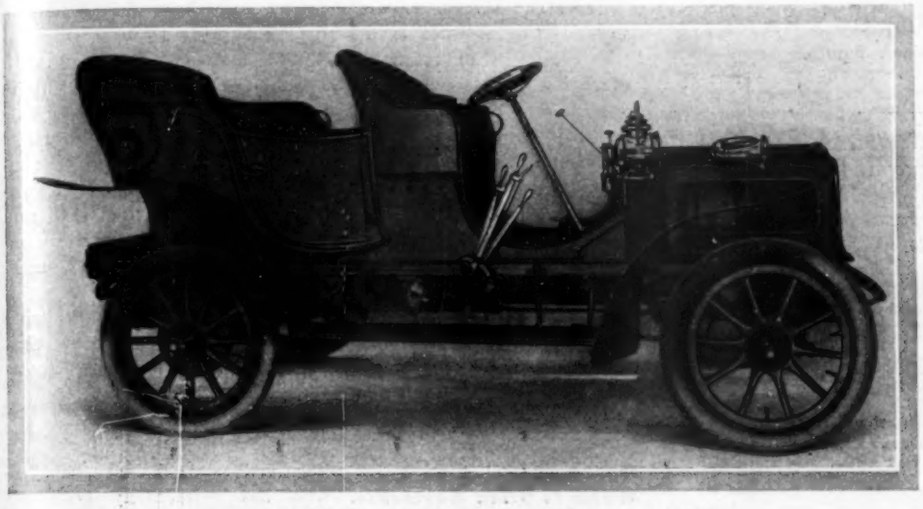
Sept. 1-8.....—Canada International Exhibition, St. John, New Brunswick
Oct. 5-14.....—Leipzig (Germany) Exhibition, Krystall Palast.
Nov. 1.....—New Zealand International Exhibition opens at Christchurch.
Nov. 1-16.....—Berlin (Germany) Automobile Exhibition.
Nov. 15-24.....—London Olympia Motor Show.
Nov. 23-Dec. 1..—London Stanley Show, Agricultural Hall.
Dec. 7-23.....—Paris, Ninth Annual Salon d'Automobiles, Grand Palais.
Dec. 15.....—Calcutta, India, Exhibition of Automobiles, etc., Automobile Association of Bengal.

#### Races, Hill-Climbs, etc.

Sept. 3.....—Auvergne Cup Race, France.
Sept. 8.....—Racing on the Sands at Skegness.
Sept. 9-20.....—Pallenza (Italy) Automobile Meet.
Sept. 27.....—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
Oct. 7.....—Chateau Thierry (France) Hill Climb.
Oct. 23.....—Gaillon (France) Hill Climb.
Oct. 30.....—Start from Paris of the Gordon-Bennett Aeronautical Cup Race.

# TWO MODELS OF WHITE STEAM CARS

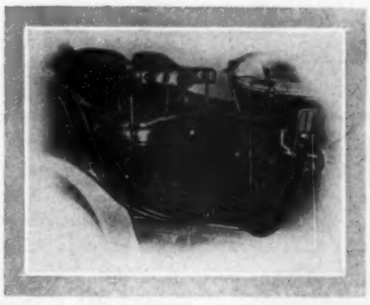
FOLLOWING its usual policy, the White Sewing Machine Company has made an early announcement of its plans for the coming season. Two distinct styles of White steam cars are to be manufactured, known respectively as Model G and Model H. Model G is larger, heavier, and a more powerful car than any which the company has heretofore produced, and in consequence is somewhat higher priced, listing with Pullman body at $3,700, and with touring body at $3,500. Model H is very similar to, in fact in most respects is identical with Model F, the type made during the season of 1905-6. Model H is made with a somewhat shorter wheel base—102 inches—and is offered at a slightly lower price—$2,500.



WHITE MODEL H, THE SMALLER OF THE 1907 MODELS.

Both the new models exhibit the same general characteristics as the well-known Model F. No one informed in automobiling matters will have no difficulty in recognizing either of the new cars as a White. The power plant consists of compound engine with White generator and auxiliary apparatus, and the makers claim a 10 per cent. efficiency has been secured by adding a feed water heater. This new auxiliary is very simple, consisting of a short coil of piping connected between the water tank and the generator, and located in the exhaust pipe leading from the engine to the condenser, and is designed to supply the water to the generator at a higher temperature and increase the efficiency of condensation.

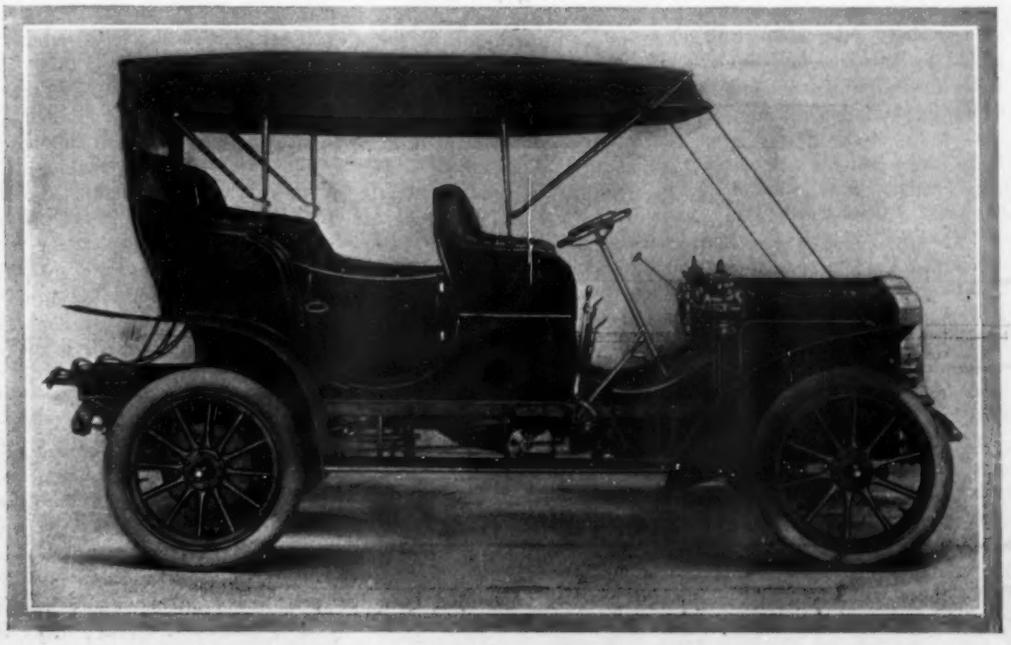
Another change in the new cars, which will be readily noticed, is the location of the gasoline tank in the rear. It is hung in a well-protected position between the rear of the frame and one of the cross braces which connects the sides of the frame, and has several inches more clearance than the rear axle, so that in the event of the latter, under some unusual conditions, running aground, the tank and connections are well removed from danger of injury. As formerly, the new White cars will be fitted with a tubular front axle, as the makers believe that this form of axle, when properly designed, will withstand the most severe vertical and horizontal stresses.



REVOLVING CHAIRS IN MODEL G.

Extensive road tests conducted by the makers have shown that Model G is capable of considerably higher speed than the present model, with abundant power in reserve. All parts have been considerably strengthened. The car is provided with 36-inch wheels and 4-inch tires for front and 4 1-2-inch tires for rear. The drums on which the brakes operate have been materially increased in size, as have also the front and rear springs. In this model the water tank has been removed to a position under the floor on the left side of the car, where the gasoline tank was located in this year's model. Two distinct styles of body are offered, the Pullman and regular touring type. In the Pullman body are two revolving seats, either of which may be removed, if desired, by simply loosening a nut fastening the supporting bracket. The clearance of the car is 10 1-2 inches.

In Model H a critical inspection shows that a number of minor changes have been made in addition to those already mentioned, the reduction of the wheel base to 102 inches necessitating them. The rear seat is four inches wider than that of Model F. All changes in this model have been along the lines of increased strength and greater efficiency suggested by the experience gained during the course of the year.



NEW WHITE, MODEL G, CARRYING SEVEN PASSENGERS COMFORTABLY.

# The Automobile

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***Folly of Doing Stunts in Driving.*** The rather difficult subject of collision forces in automobiles is discussed in a very simple and interesting way in this issue by Dr. William F. Durand, the eminent physicist and engineer of Stanford University. It can be read profitably by all those who own or drive automobiles, and doubtless many such will be surprised to learn the magnitude of the forces which are involved in the operation of a machine. No information is more necessary or useful to a driver, and yet it is not an exaggeration to say that comparatively few drivers have any real conception of the facts. One has only to watch the handling of machines in or out of a large garage or on the road, near some popular resort, to realize that what passes for clever driving is often the outward manifestation of a profound ignorance of the dynamics of automobiling. Usually the driver, who is fond of making a "grandstand" stop, finds some day, to his consternation, that the brakes fail to work, and within a few feet he makes a big repair bill instead, and learns not to monkey with a buzz saw. There is another class of better-informed drivers who are naturally reckless, and who find a special delight in taking chances because they know the risks.

It can be laid down as a rule of general application that the man who habitually does stunts with his car, shaving vehicles in traffic, making quick stops and the like, is either ignorant or reckless, and usually the former. Fortunately, sensible drivers are largely in the majority, just as sensible persons outnumber the other kind in any other form of sport or recreation, and no doubt these will be confirmed in their practice of caution by a careful perusal of the discussion by Dr. Durand.

***A Dustless Roads Association at Work in Britain.*** How to bring about dustless highways is a problem, the quick solution of which interests all automobilists. True we have such remedies as oiling, tarring, westrumiting, and the latest is the use of calcium chloride, but the true abatement of dust must trace back to the construction and repair of the road itself. On the other side the question is just now receiving unusual attention in England, where a Dustless Roads Association has been organized, its membership coming substantially from the ranks of the automobilists.

Secretary Vaughan, in calling attention to the Association, says: "The trouble is mainly attributable to the fact that the roads in many instances are made or repaired with materials which are easily converted into dust. Our efforts are, therefore, chiefly directed towards the elimination of this fault by bringing to the notice of the various road authorities concerned the means by which improvements may be economically effected. Because automobiles raise a larger proportion of the dust that happens to be on the road than any other vehicle, they are frequently blamed for the very existence of the dust, and, consequently, have to endure much unfair criticism."

It would be an excellent move by the A. A. A. to bring about in this country a sub-organization of some sort that will concern itself with this most vital subject of such growing need to automobiling.

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***The Turning of the Auto Worm Is Often Advisable.*** To strike back at someone who has deliberately gone out of his way to annoy or injure an autoist on the road, is not always advisable, or otherwise worth while.

A short time ago a Boston party, consisting of one man and two women, touring in the vicinity of Winsted, Conn., met a farmer who refused to give them half the road. As the car struggled by on the narrow edge, the horse owner lashed at the autoists with a heavy whip, such as oxen rather than horses are driven with, so the newspaper reports say. The driver stopped his car and jumped out to see what could be done about it, but as this husky son of the soil was well armed and on his native heath, discretion was accounted the better part of valor—at least for the time being. So the autoists drove on, while the farmer no doubt thought he had come out ahead.

So he had for the moment, but investigations were quietly undertaken, with the result that last week accounts which this farmer was found to have in two banks, and also some real estate standing in his name, were attached by the deputy sheriff to secure two suits of $2,000 each for personal damages. The probabilities are that by the time this fellow gets through he will have a more decent respect for the rights of others on roads that belong to the whole people.

The fact that the participants in the recent A. A. A. tour were on a time schedule between Utica and Saratoga is undoubtedly all that saved one sorehead farmer near Frankfort, N. Y., from something more tangible than uncomplimentary remarks as the procession of competing vehicles passed by. This fellow stopped his team and wagon (loaded with milk cans) squarely on the traveled half of a wide stretch of road, compelling the whole line to bump over the ruts of the untraveled half.

There is such a thing as "turning the other cheek" too readily, and thus making it harder for autoists who come afterwards to secure their legal rights. Only be sure you are right before going ahead—sufficiently so to convince a jury of the offender's own "peers." And if you do begin an action of any kind, make it a point either to be personally on hand or well represented when the case comes to trial. Actions of this kind lapsing by failure of the plaintiff to appear leave an especially bad impression; and if anything, tend to make the offence more frequent.

## PATHFINDER POST IN VIRGINIA.

WASHINGTON, D. C., August 26.—Travel-stained and weary, Augustus Post, of the Touring Committee of the American Automobile Association, and two officials of the Jamestown Exposition, arrived in the national capital from Norfolk, Thursday afternoon, having been on the road five days in an endeavor to find a suitable route for the A. A. A. tour next year. The White steamer of Mr. Post was caked with mud, and bore witness that the roads of Virginia are trying propositions, especially after the incessant rainfall the party encountered. Mr. Post's associates on the trip were Robertus Love, of the Exposition press bureau, and T. C. Muller, official photographer of the Exposition, and both these gentlemen say the trip was the most exciting they had ever taken. The Highway Commissioner of Virginia, Capt. St. John Wilson, accompanied the tourists from Norfolk to Fredericksburg, and if he was not impressed with the fact that the roads of the grand old State of Virginia are in extremely bad shape, he is not onto his job.

The investigating party left Norfolk Saturday morning, August 18, and arrived in Richmond Sunday night. Bright and early Monday morning they got started again on their journey, and, although the roads were in bad shape for the greater part of the way, fair time was made.

A number of hills were encountered and some of them were hard to negotiate, on account of the softness of the road. Tire chains were frequently used. The party was delayed several times by high water at the different fords, and at one place had to wait more than six hours for the water to recede. Lack of accommodations along the route made these experiences very exasperating, and the tourists were delighted when they reached Manassas, for a good pike runs from that town straight through to Washington.

Mr. Post made careful notes all along the route, and these will be incorporated in the report he will make on the trip. Numerous photographs were also made. It is Mr. Post's intention to remain in Washington several days, and then he will go back to Norfolk by way of the Shenandoah Valley. This is an ideal trip and one that is interesting from the time the tourist leaves Harper's Ferry until he gets far down the valley.

In the event that Jamestown gets next year's A. A. A. tour, it is the intention of the Exposition company to build a fine boulevard eighty feet wide from Norfolk to the Exposition grounds, a distance of eight miles. The sum of $150,000 has been set aside for this purpose, and it is the intention to make this a very prominent feature of the Exposition. A carnival will be held next spring, and all sorts of automobile contests will be given. A similar carnival will also be held in the fall. A number of handsome prizes will be offered, both by the Exposition company and the city of Norfolk, and it is evident that automobiles will play a very important part in the Exposition. Mr. Post told THE AUTOMOBILE correspondent that Norfolk has an active automobile club, and the enthusiasts there are preparing to hold out the glad hand to visiting automobilists next year.

## VIRGINIA WOULD WELCOME A. A. A. 1907 TOUR.

Editor THE AUTOMOBILE:

I see in the New York "American" of the 20th inst. a sharp criticism of the manner the Glidden Tour was handled by the officials, and it goes on to say that the 1907 prospective tour to Jamestown Exposition would be unpleasant, and ascribes the lack of hotel accommodation and local hostility to automobiling as the chief reason for discouraging the Southern trip. I was born and reared down here, and know Virginia and its people fairly well, and the general conditions, too, and I also know of some of the people and conditions in other sections where the previous A. A. A. tours have been held. Possibly I have travelled more in the territory of the "American's" writer than he has travelled in mine, both in auto and on bicycle.

He claims that Jamestown would be unpleasantly warm in August. As a matter of fact, the difference in latitude would not be noticeable, and if there would be any difference New York City would be the warmer of the two. It is quite true Virginia is not foremost in adopting the new form of locomotion, but that condition is not so much one of inherent hostility as it is ignorance of the pleasure of automobiling, which is probably traceable to the lack of means to possess expensive machines of travel which the New Yorker can afford.

There is no better road anywhere than the Shenandoah Valley turnpike, extending practically from Harrisonburg, Pa., to Lexington, Va. (275 miles), while the road beyond Lexington is not one of the ditch, block and tackle kind by any means. We don't have officers of the peace shooting at automobiles; neither do we have anti-dust legislation, and most all, if not all, of the only trouble we have ever had is caused by reckless and inhuman drivers from distant states and larger cities taking advantage of our good roads and tearing through the country at top speed, regardless of the lives and rights of other users of the highway. And even with this I have not yet heard of a single suit for damages.

The people in this section are quiet and peaceable and would welcome such an excursion as the A. A. A. tour, and would divide their rations with the strangers and treat them right, and there would be no overcharging for meagre accommodations. Our people have not learned how to make a bed in a tent worth $5, or $2 either, and if the Gliddenites come this way next year I bespeak a wholesale welcome and a good time for all.

J. FRANK EDDY.

Winchester, Virginia.

## A CAR THAT HELPED GOOD ROADS FUND.

OCONOMOWOC, WIS., August 20.—Here is a picture of the Pope-Toledo car that was used by a woman to advertise and manage a carnival that raised $10,000 to improve the roads in the interest of good automobiling. The car belongs to Lawrence Fitch, and was used by Mrs. Fitch, who is the daughter of A. J. Earling, president of the Chicago, Milwaukee & St. Paul Railroad. Mrs. Fitch originated the idea of the function for the purpose of awarding prizes to path masters for keeping up the roads in and about Oconomowoc and Waukesha county.

LAWRENCE FITCH'S POPE-TOLEDO.

At times the car was filled with different-sized posters and other advertising matter announcing the features of the carnival, and it was driven about the country distributing same for posting on fences, trees and dead walls. The snapshot of the car was taken while Mrs. Fitch had gone to ask a conductor on one of her father's swell passenger trains to distribute some of the advertising literature for the carnival along the route, a feat that he performed very satisfactorily.

## A BIG ALUMINUM PLANT AT THE FALLS.

BUFFALO, August 27.—In view of the extensive use of aluminum in the manufacture of automobiles, it will be of interest to the makers to know that plans are afoot for the construction of a big aluminum manufacturing plant at Niagara Falls, to be operated by Falls power. An idea of the magnitude of the concern which is to build the plant is given in the fact that the company is one with a capitalization of $3,000,000. The new plant will be on the New York side of the Falls, and will be distinct from the aluminum plant now on the Canadian side, which is also operated by Falls power. It is likely further information regarding the concern will be kept under cover until a site is secured and building contracts let.

**Under the name** of Societa Automobile Brevitti Fiat a new company has been founded by the original house of Fiat in Turin for the manufacture of small cars.

## CONNECTICUT MAN'S HERKOMER COMMENTS.

C. F. Heublein, of the Automobile Club of Hartford, Conn., recently returned from a three months' trip abroad. Mr. Heublein entered his 30-40-horsepower English Daimler in the Herkomer race, and gives a very interesting account of the general management of the contest.

"Aside from the delightful scenery and the general pleasure of touring, the Herkomer race was not a success," said Mr. Heublein. "There were about 130 cars entered, each supposed to carry four passengers. The matter of our accommodation was not left to any committee; each was supposed to provide for themselves. The prices were possible increased along the road a small percentage, but not to any great extent. There were thirteen English Daimlers in the contest, all the property of private owners. The only interest the company took in the matter was to send a man ahead for our hotel accommodations, which were very well cared for. I was awarded the silver plaque, which I have brought with me.

"There was general dissatisfaction with the formula that governed the race. It was mathematically wrong and in many cases it was absolutely impracticable. Each morning we were allowed forty-five minutes to fill the gasoline and oil and make such arrangement of our baggage as we desired, but no time was given us, or permission granted to make any adjustment to the machinery. A number of protests were filed each day as a result of the rules governing the contest; several were filed against the Mercedes and Italian cars for entering cars of a racing type.

"The donor was one of the most dissatisfied of the entire party, and says that another year he will take a more active part in the management and dictate the conditions under which the run must be made. In discussing this matter with me personally, I conclude that another year will result in very much better conditions than those existing this year."

## THE THIRD TRIP FOR THE "PACKARD 30."

The "Packard 30" made its third trip from Detroit to New York last week, leaving early Sunday morning at 5:30 o'clock, with Chief Engineer Huff at the wheel. The dinner stop was not made for 227 miles, or until Hamilton, Ont., was reached. The night stop was at Buffalo. It was a rainy day's run on Monday from Buffalo to Utica, and the same unfavorable weather conditions continued on Tuesday in the run from Utica to New York City. The entire running time was less than twenty-nine hours and, outside of tire troubles, Mr. Huff said that he experienced no difficulty whatever. The car is now on its way back to Detroit, calling at the various Packard agencies between New York City and its Michigan home.

## E. R. THOMAS DETROIT CAR NEARLY READY.

This coming fall will show an increase in the makers who are ready for early fall deliveries, and among these makers will be the new E. R. Thomas Detroit Company. In the brief time of a little over a month and a half this company has gotten into its factory, installed all the machinery, has completed and gotten together the parts for the first few sample cars, and expect to have car No. 1 running on the streets of Detroit within the next week. The company has its schedule so made that it will be able to deliver 100 of the new light Thomas cars before the New York show, and between that time and June the balance of the output of 500 will come through steadily month by month.

## MILWAUKEE'S MOTORING MAYOR ON A TOUR.

MILWAUKEE, August 27.—Mayor Sherburn M. Becker, president of the Milwaukee Automobile Club, left Milwaukee Thursday afternoon, August 23, in his Pope-Toledo, accompanied by his private secretary, W. F. Hooker, his chauffeur, and two newspaper men. At Cleveland he delivered an address on "The Young Man in Politics." The Mayor and party then continued their trip eastward, stopping at Niagara Falls and then heading for New York.

## PRESS TOOK THE AUTOMOBILIST'S END.

PHILADELPHIA, August 27.—The fly cop with the gun has been added to the woes of the Quaker City automobilist. As if double tags and double tolls were not enough, they must have this additional evil. Twice last week, while passing along the Old York road, in the borough of Abington, automobilists were halted by leaden pellets from the shooting iron of a super-serviceable cop.

The central figure in these cases proved to be one Haseltine Lever, brother of the chief of police of the borough. The Automobile Manufacturers' Representatives' Association of Philadelphia has consulted counsel in the hope that an example may be made of him. The Automobile Club of Philadelphia also sent an open letter to the magistrate who heard the cases, taking him to task for allowing Lever to go without even a reprimand.

The way the local papers, without exception, took up the automobilists' end of the affair was refreshing. Public opinion here, distinctly unfavorable to motorists for the past year, veered instanter. The dictum that "automobilists have rights" was asserted openly and with emphasis, and unless Lever's example has an evil effect upon some other idiot clothed with authority, the net result may be said to be favorable to local automobile operators.

## AUTOMOBILE TOUR OF ISLAND OF JAMAICA.

Announcement has been sent out for an automobile tour of the Island of Jamaica, West Indies, leaving Boston October 31 and returning due to arrive November 26. One of the "Admiral" fleet of steamers of the United Fruit Company has been chartered exclusively for the party, and this tour is thought to be the first automobile journey ever held where a boat has been reserved exclusively for the party and their automobiles.

While the itinerary has not been published as yet, Chester I. Campbell, at 5 Park Square, Boston, who has charge of the tour, states that after a most enjoyable sea trip of five days from Boston the party with their machines will disembark at Fort Antonio on the north coast. The route will cover every interesting part of the island, including admission to many of the private coffee, banana and sugar-cane estates. The cost of the trip will be very nominal, and Mr. Campbell has made arrangements for several seats in private machines for those who are not owners of automobiles.

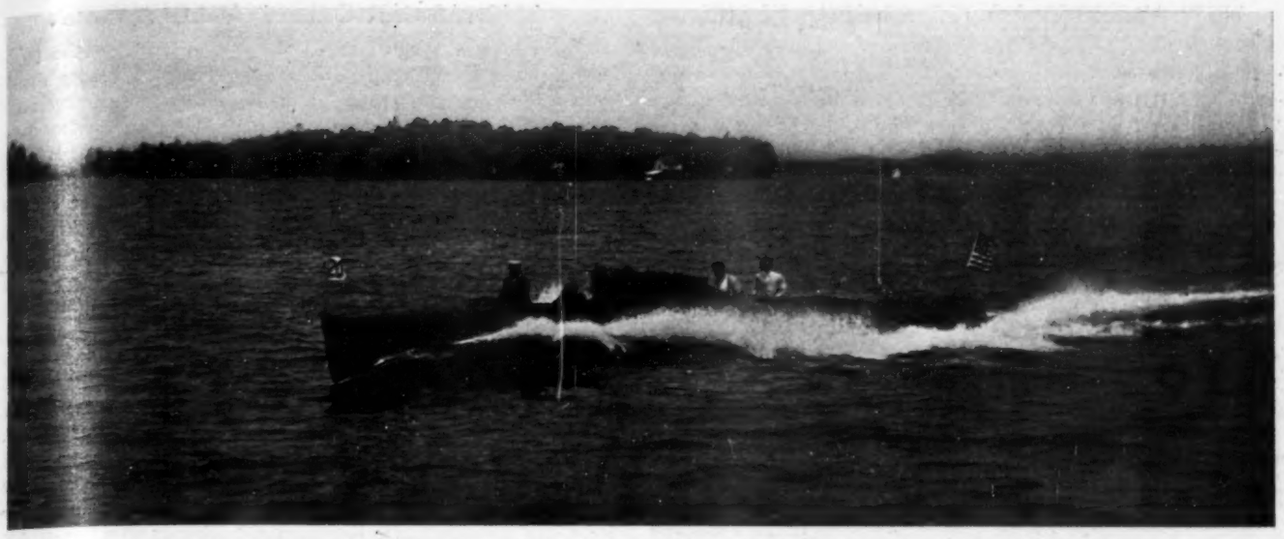
## GOVERNMENT TRIAL OF MAIL AUTOS.

WASHINGTON, August 27.—If an experiment soon to be tried in Baltimore proves a success, automobiles will probably be used in the collection of mail in New York and all the large cities of the United States. Acting Postmaster-General Frank A. Hitchcock believes that the one-horse wagons now used in the collection of mail can be advantageously superseded by automobiles, and he has decided to test the scheme in Baltimore, because that city is the first in which a contract for collection wagons will terminate, and, in addition, Baltimore is hilly, and will furnish a thorough test of the automobiles under unfavorable conditions.

The contract for collection wagons does not terminate in New York City until 1909, but if the automobiles prove a success the Post Office Department will establish an automobile collection service in New York without waiting for the end of the wagon contract.

## REORGANIZATION OF THE OVERLAND COMPANY.

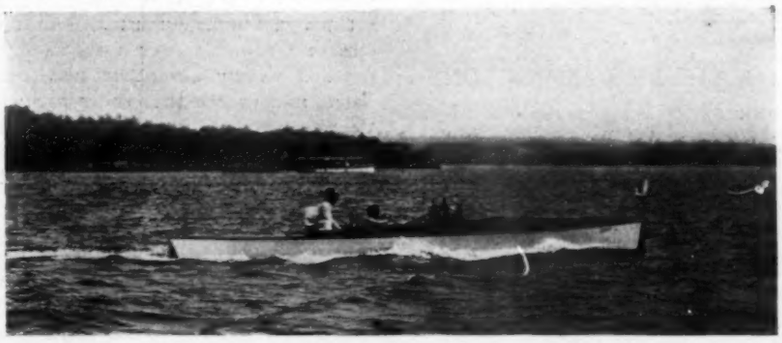
INDIANAPOLIS, IND., August 25.—The long-expected reorganization of the Overland Automobile Company is being effected. A company is now being formed, headed by D. M. Parry, a well-known carriage manufacturer, to take the plant. Something more than one year ago the Standard Wheel Company disposed of its automobile business to Claude E. Cox, and he has kept the factory open, employing a few men to make experiments with 1907 models. It is understood that the present site of the factory will be retained, but that it will be greatly improved and enlarged.



PRICE McKINNEY'S 60-HORSEPOWER STANDARD, WHICH WON FROM THE DIXIE BY 36 SECONDS.

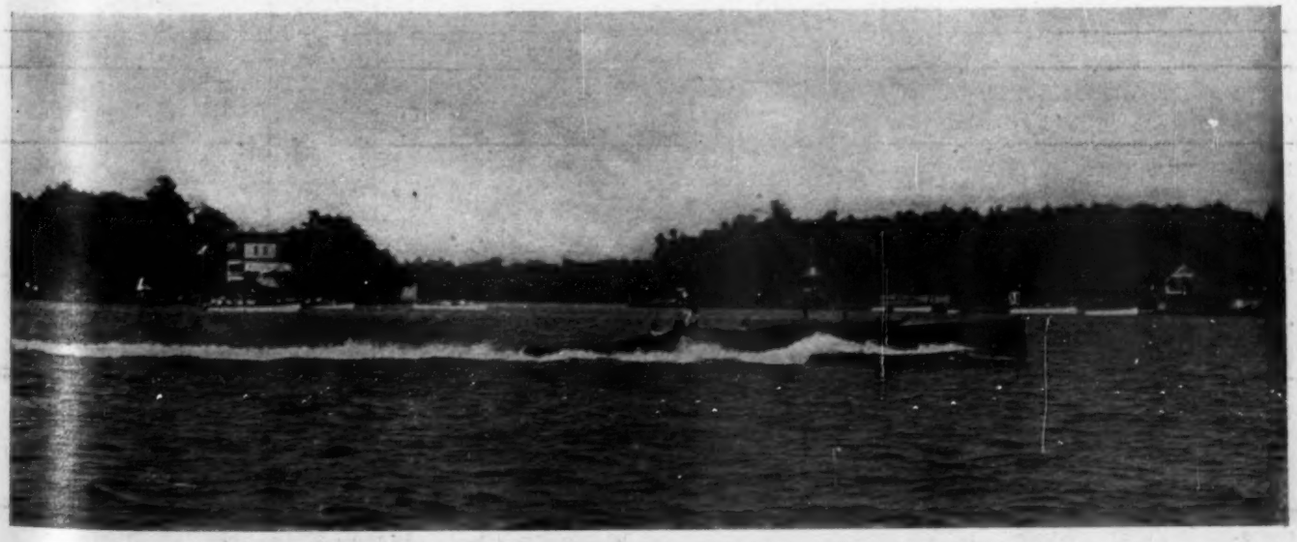
## CONTEST FOR THE GOLD CHALLENGE CUP.

Good racing, close finishes and a protest involving two of the principal performers characterized the three days' race meet of the American Power Boat Association held at Chippewa Bay, commencing August 21. The races were for the gold challenge cup, and there were twelve entries from clubs throughout the country. First to finish the thirty-mile course in the first race was *Sparrow*, owned by C. J. Swain, of the Riverton Yacht Club, Philadelphia, her time being 1:22:14. Jonathan Wainwright's *Chip II*, of the Chippewa Yacht Club, winner of the gold cup last year, was second in 1:32:52, and Mrs. E. S. Burke's *Jewel*, Thousand Islands Yacht Club, third in 1:38:07. Next day the second race was run and *Chip* this time drove her sharp bow first over the line, 3 minutes 46 seconds ahead of *Sparrow*, while *Jewel* again took third place; *Dixie*, fourth; *Vingt Trois*, fifth; *Vingt-et-Un II*, sixth; *So Long II*, seventh; *Guess Again*, eighth; *Panhard*, ninth. The *Dixie* made the best average time and established a new world's record for 15 miles by covering that distance at the rate of 28.3 miles per hour—a remarkable performance.



JONATHAN WAINWRIGHT'S CHIP II, WHICH WON THE GOLD CHALLENGE CUP.

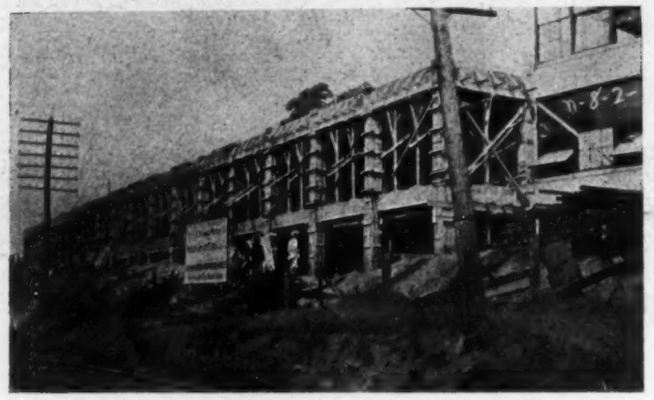
Rough water and a stiff wind did not prevent the boats from starting August 23 in the third and last race, and *Chip* again came to the front, with *Sparrow* and *Jewel* second and third. The performance of *Chip*, however, in running thirty miles in rough water within two minutes of her time over a smooth course, aroused suspicions, and the result was a protest, the ground of which was that the engine, rated at 16 horsepower, really developed 31 horsepower Nor did *Sparrow* escape, for it was declared that there was a bulge in her midship section, put there, it was claimed, to beat the rules governing contests for the gold cup. Both protests were sustained by the regatta committee, and it remains for the executive committee of the American Power Boat Association to act on the protest.



E. J. SCHROEDER'S 150-HORSEPOWER DIXIE, WHICH MADE WORLD'S RECORD FOR 15 MILES.

## NEW ADDITION TO THE THOMAS PLANT.

A great increase and demand for Thomas Flyers during the past two years has made necessary the erection of an immense addition to the works of the E. R. Thomas Motor Company, at Buffalo. As can be seen by the cut, the building is now under construction, and when completed will be one of the finest examples of factory building in the world. It is made with the new



HOW THE THOMAS FACTORY IS BEING ENLARGED.

system of concrete, reinforced with steel. The dimensions are 260 feet in length by 60 feet in width, and four stories in height. It is expected the new structure will be ready for occupancy some time during September, when machinery will be installed for the first of the 1907 Thomas product.

## CARTER CO. MAY LOCATE IN WASHINGTON.

WASHINGTON, D. C., August 25.—There is some talk of the Carter Motor Car Co., of Detroit and Milwaukee, starting a factory in this city. Strong efforts are being made to bring different manufactures to Washington, and this talk of the proposed Carter factory is the result of this Greater Washington movement.

## FIRESTONE WILL HAVE NEWS FOR TIRE USERS.

AKRON, O., Aug. 25.—The annual stockholders' meeting of the Firestone Tire & Rubber Company was held at the company's general offices Wednesday, August 15. The annual statement showed a large increase in volume of business the last fiscal year, during which period the plant capacity has been tripled and several new branches established.

The following directors were re-elected: H. S. Firestone, Will Christy, A. C. Miller, R. J. Firestone, and L. E. Sisler. The directors met and re-elected the following officers: H. S. Firestone, president and general manager; Will Christy, vice-president; S. G. Carkhuff, secretary; L. E. Sisler, treasurer.

The annual Firestone Convention of Branch Managers and Salesmen held an enthusiastic session August 17 and 18. When approached for information as to what action was taken at the convention the officials were averse to making any definite statements. There will be news of interest to tire users in the near future.

## THOMAS CAR CUTS 50 MILE RECORD.

PHILADELPHIA, August 27.—Promoted in a hurry—the public had barely a week's notice of the affair—last Wednesday's automobile races at Point Breeze track far exceeded in interest and attendance any similar meet ever held in this city. The magic names of "Oldfield—Bald—Cooper" in huge letters, displayed in every conspicuous place downtown, did the business, and fully 8,000 people overflowed the stands and lined the outer edge of the track when the first race was called. Barney drove his *Green Dragon* to a new track record of 1:02 flat, clipping four-fifths of a second from the previous best. But the best performance of the day in the record-breaking line was the reduction of the 50-mile American record for touring cars to 1:03:19 3-5 by E. R. Kelly in a Thomas Flyer—a gain of 2:59 2-5 over Ollie Savage's Chicago mark, also made with a Thomas.

Six cars lined up at the wire for the 50-mile Great Quaker Endurance Derby—Stanley, driven by Howard Gill; Packard, W. Wayne Davis; Cleveland, "Wally" Owen; Cleveland, Joe Laughlin; Matheson, Tom Cooper, and Thomas, E. R. Kelly. The cars were bunched for two miles, when Gill sent his Stanley steamer to the front. In the eighth mile Kelly sent his Thomas after the steamer and overhauled it on the backstretch. Gill retired on the next lap. The Thomas, after having disposed of the dangerous steamer, began to pull away from the others steadily and soon began to lap its opponents.

The other events were well contested. Arrangements are under way for another meet here, to be held about September 15.

## PECHIN FOR CHINA: MORE WORK FOR GRECE.

DETROIT, MICH., August 27.—Over in Japan they have White steamers running over a territory of 280 miles on schedule time. Recently seventeen new omnibuses were sent over there, and to see that these are properly operated, John S. Pechin, who has been identified with the automobile trade here for two years as manager for Michigan of the White steamers, will spend three months in Japan. Pechin is now in the East, but will sail from Vancouver, September 3, going directly to the "Land of the Mikado." The Michigan agency is now in the hands of Harry H. Grece, who has been with the White people for ten years in the wholesale business, and who, in addition to the Michigan selling end, which he has handled for some years, will also take charge of the garage and retail automobile business in Detroit.

OFFICERS, BRANCH MANAGERS AND SALESMEN OF THE FIRESTONE TIRE AND RUBBER COMPANY, AT THEIR ANNUAL CONVENTION, AUGUST 17-18, AKRON, O.

Back Row—W. W. Wuchter, E. E. Cahow, F. Z. Binkard, R. J. Firestone, G. D. Armstrong.

Middle Row—J. L. Keller, W. A. Wells, J. T. Glenn, J. F. Singleton, R. V. Smith, C. E. Jackson, A. G. Partridge, H. S. Firestone, S. G. Carkhuff, W. P. Berrien, O. O. Petty, E. E. McMaster, O. R. Cook, J. D. Hodgkins.

Front Row—W. E. Fouse, F. R. Talbott, J. E. McGinness, A. J. Greene, W. D. Rockwell, J. L. Gibney, . . Gilbert.

THE SEVENTEEN FRANKLINS WERE PHOTOGRAPHED IN CLINTON SQUARE, SYRACUSE, BEFORE THE START.

## AUTOMOBILE MAKERS AT PLAY.

The Associated Heads of Departments of the H. H. Franklin Mfg. Company, of Syracuse, N. Y., is an organization which, as its name implies, embraces within its membership the heads of departments of both factory and office. An outing is arranged for once a month during the summer, and the last one held partook of the nature of a long tour, for which seventeen cars were furnished by the Franklin company, and which carried the members of the association through some of the most picturesque and historic regions of central New York.

The long line of air-cooled cars left the works at 1 o'clock in the afternoon and, after posing for the above photograph at Clinton Square, left the city by the way of the old Fayetteville toll road, through the little hamlet of Orrville, and the beautiful towns of Fayetteville and Manlius. The whole country hereabouts teems with Indian relics, and traces many hard-fought battles between them and the early settlers are to be found, notably the old Indian fort near the village of Oran. The next stop was Cazenovia, some 900 feet above the level of Syracuse, where a magnificent view of Cazenovia Lake and the surrounding country is presented. Chittenango Falls and Chittenango Springs were visited prior to the return trip to Syracuse.

## ANNUAL OUTING OF THE POPES.

Friday, August 17, was a gala day with the office and factory force of the Pope Manufacturing Company, which went *en masse* to Savin Rock, Conn., for a day's outing and recreation, such as is annually indulged in by these people. The party left the factory at Hartford in twenty-seven automobiles, and drove the entire distance to Savin Rock, where land games and aquatic sports and a fine shore dinner were indulged in.

The procession was led by Albert L. Pope, vice-president of the company, in a big 45-horsepower Pope-Toledo, and Charles E. Walker, second vice-president, Col. George Pope, treasurer, and W. C. Walker, secretary, each drove a machine on the trip. A car driven by C. E. Spencer, assistant manager of the New York branch, came up from the metropolis for the occasion and joined the party at Savin Rock. E. E. Hinsman, manager of the Pope factory at Westfield, Mass., also brought a party in automobiles, joining the Pope force at Hartford.

A ball game between the Hartford and Westfield factory forces resulted in a tie. In these outings where officers, heads of departments and assistants come shoulder to shoulder with their fellow workmen, the *esprit de corps* is materially advanced and the general result is beneficial and far-reaching.

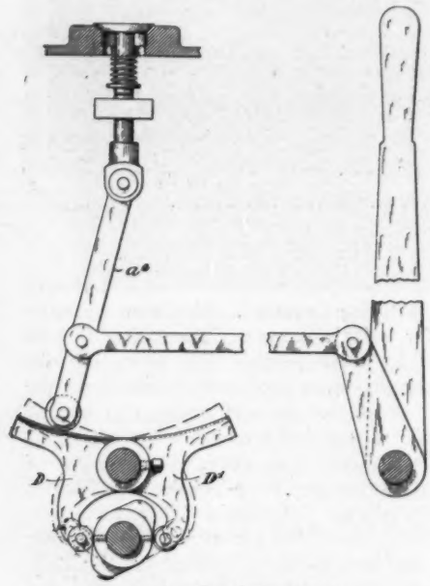
THE POPE PARTY AS IT APPEARED WHEN MEETING THE PHOTOGRAPHER EN ROUTE TO SAVIN ROCK

# Patents

### Reverse Gear for Gas Engines.

No. 828,064.—J. W. Slater, of Slatersville, R. I.

Instead of the exhaust gears acting through on the valve bushrods, they act through the medium of the bell cranks *D D'* shown. These bell cranks are wholly separated, and each is in line with one cam only, consequently when the pushrod $a^4$ is shifted from one bell crank to the other, it is acted on by the other set of cams, which is so timed as to run the engine in the reverse direction.



SLATER'S REVERSING GEAR.

### Combined Intake and Exhaust Valve.

No. 825,867.—A. G. Ronan, of Toronto, Canada.

This is a large single valve in the top of the cylinder head, operated by push rod and lever. Over the valve and communicating with it is a funnel-shaped hood, which is directed to catch the air current created by the vehicle's motion. The small end of the funnel discharges downward to the rear of the cylinder, and the intention is that the current of air blowing through the funnel shall carry the exhaust gases with it during the exhaust stroke, and shall enter the cylinder by the suction during the intake stroke, the valve being held open continuously through both strokes. The device is intended only for bicycle motors and the like.

### Exhaust Signaling Device.

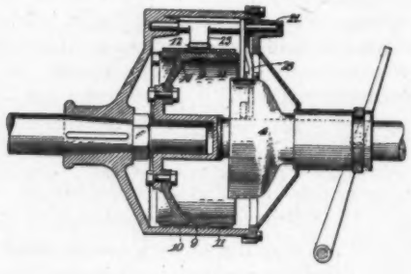
No. 825,694.—E. and G. Barbaroux, of Turin, Italy.

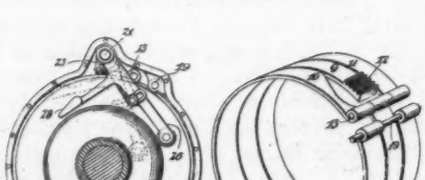
A valve by which the exhaust gases are caused to pass either through the muffler or through the horn for the purpose of signaling. The special feature of the valve is a small bleeder orifice communicating with the muffler to prevent excessive pressure when using the horn.

### Friction Clutch.

No. 827,091.—G. E. Franquist, of New York City.

This clutch is intended to be an improvement on the spiral spring wind-up clutch used in the Mercedes cars. It is claimed that that form of clutch exerts more pressure on one edge than on the other of the spiral spring, thereby tending to form grooves in the clutch drum. The twisting action of the spiral springs is avoided in the present form of clutch. The two outside clutch bands *10 11* are anchored at *19*, and their free ends are connected to the rod *13*, which anchors one end of the central band *9*. The free end of *9* is tightened by a rack *12* and segment *23*, operated by the lever *26* and spreader *4*. As *9* is tightened it applies tension to the free ends of *10 11*, thereby tightening them. A counter weight *28* is employed to overbalance the lever *26*, and insure the clutch staying released, as shown by the dotted lines, when the spreader is withdrawn.



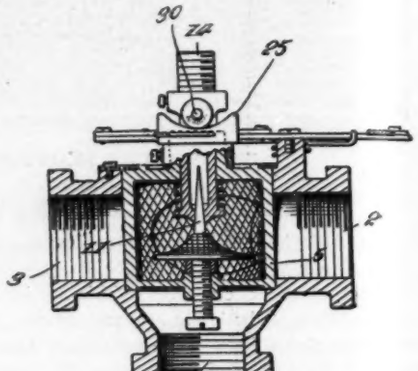


FRANQUIST'S FRICTION CLUTCH.

### Carbureter.

No. 827,094.—W. W. Grant, of Brooklyn, N. Y.

This is a mixing device without a float, in which the air may enter at any one of the connections *2*, *3* or *4*, and goes out at any one or two of the others. The gasoline enters at *14* and issues from the spray nozzle, surrounding the fixed needle valve *11*. The nozzle may be raised or lowered by rotating it, as it is connected with the roller *30* which runs on the cam *25*. It is connected also with the shutter *5*, which has elliptical slots in it, and which acts as a throttle valve when it is rotated.

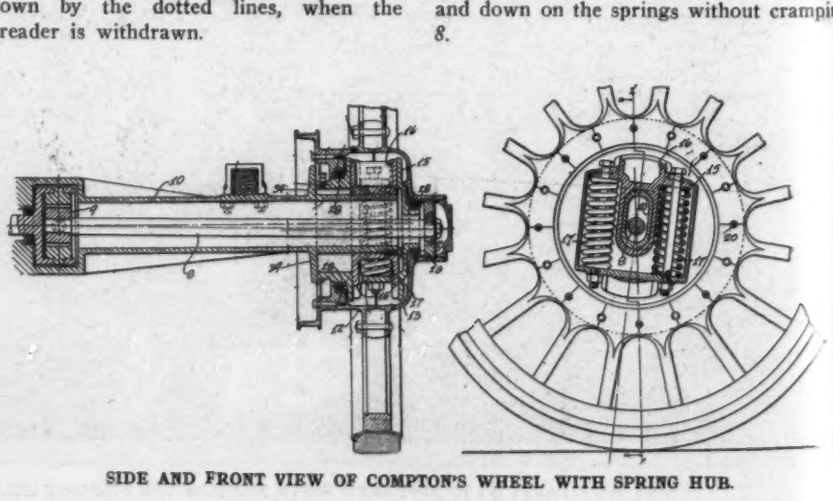


GRANT'S FLOATLESS CARBURETER.

### Spring Wheel.

No. 827,058.—L. R. Compton, of East Orange, N. J.

A modification of the Cliff spring wheel, whereby a live axle and shaft drive may be used. In the drawing, *8* is the live shaft within the axle *10*. Inside the hub, *10* enters a frame *16* having ears resting on the upper ends of springs *17 17*. A casing *15* guides *16* and has ball bearings *28 28* whereon runs the wheel hub, which is split in two halves *12 13*. A flange *39* prevents dirt from entering the hub, and cardan joints *9* and *21* permit *10* and *16* to play up and down on the springs without cramping *8*.



SIDE AND FRONT VIEW OF COMPTON'S WHEEL WITH SPRING HUB.

# NEWS AND TRADE MISCELLANY.

The Adams & Westlake Company, 110 Ontario street, Chicago, well-known makers of finished brass goods, has started the manufacture of automobile lamps on a large scale.

The R. D. Nuttall Company, Pittsburg, Pa., has increased the equipment of its small gear department to such an extent that the concern will be able to double its output of bevels and worm gearing.

The De Witt Automobile Company, 248-250 W. Eightieth St., New York City, has recently made many improvements, and it is now one of the best equipped storage places on the west side. The De Witt company also has a sales department.

Lack of entries has caused the postponement of the economy contest that the New York Motor Club had scheduled for and arranged to hold this week. The eight entries received were considered insufficient to make a contest worth while, and the run will be held at some future date to be decided upon at a meeting of the governors of the club.

The Kilgore Pneumatic Shock Eliminator Company, of Boston, report an exceptional trade, the city being full of automobile tourists from all sections of the country, who are taking advantage of the opportunity offered to have Kilgore cushions properly attached to their cars at the company's workshop. One day last week cars from Watertown, and Springfield, Mass., Utica and Buffalo, N. Y., and Cleveland, O., were fitted with Kilgores.

Eastern Sales Manager Percy Owen, of the Aerocar Company's New York branch, reports a heavy hot weather trade, ten cars having been sold the past week at his place of business, Broadway and Seventy-third street, eight of which were delivered immediately. Mr. Owen states that this heavy trade in the midst of the dull season is a practical demonstration of the successful operation of the air-cooled motors of the Aerocar in extremely warm weather, disproving the criticism that motors of this type will heat more readily in high temperatures.

Ground has been broken for the new factory building of the Babcock Electric Carriage Company, of Buffalo, which when completed will give the company three times its present capacity of output. The new building is 300 feet long by 50 feet wide, of fireproof brick construction and two stories high, and the company owns adjoining property, which will allow the erection of two more buildings of the same size. The old plant will be used exclusively for garage purposes. The new factory will be ready for occupancy about the middle of November.

Recognizing the general lack of knowledge on the part of the buying public concerning ignition apparatus, the Dayton Electrical Manufacturing Company, of Dayton, O., has compiled a form of inquiry blank which will prove of vast assistance to all classes of gas engine users, whether they use the Dayton company's apparatus or not. In response to these inquiry blanks a special form of answer blank is prepared which first illustrates the form of wiring necessary for the inquirer's outfit, and next gives the essential instructions for the proper running of same.

Rules governing the Seventh National Automobile Show, to be held in Madison Square Garden, New York, January 12 to 19, 1907, have been issued in booklet form. While naturally the majority of the regulations are of well-known character, there are some new rules that are of interest. For instance, the price of admission on Tuesdays and Thursday will be $1, while on other days the regular price of fifty cents will hold good. Special season tickets, good for four daily admissions daily, will be issued to exhibitors only for $5.

"The value of the governor," says Charles F. Barrett, who finished the memorable A. A. A. Tour with a perfect score and then won the class event in the Crawford Notch hill climb in a 28-horsepower Columbia, "was most conclusively proven in the tour. Time and again it was necessary to throw out the clutch when running at a good rate of speed, the governor, of course, controlling the engine, which otherwise would race, much to its detriment. It certainly saves a great deal of wear on the engine, besides simplifying the control of the car. To my mind, the governor is absolutely essential."

A report from abroad tells of some interesting experiments conducted by S. F. Edge in an effort to decrease dust-raising. Mr. Edge, according to a letter received by President Hartford, of the Hartford Suspension Company, had a six-cylinder Napier driven over a road with the shock absorbers loose. The photograph taken showed a great raising of dust. Subsequently, with the shock absorbers operating and with the car going at the same speed, there was only very little dust raised. Mr. Edge claims that the shock absorbers keep the wheels in contact with the ground and prevent the leaping from hillock to hillock, which contribute to the dust evil.

An output of over 2,000 motors is the bright prospect which the Continental Motor Manufacturing Company is looking forward to for the coming year. Since the company removed to Muskegon, Mich., from Chicago, the facilities have been doubled, and the output of motors has been trebled. All the orders that can be filled for the coming year have been taken, and many orders will date to 1908. The new factory occupies about 6,000 square feet and two additions are being constructed, one for the accommodation of new machinery, and the other to be used as a shipping room. The company employs 100 men at present, but preparations are being made to increase the force for next year.

Frank X. Mudd, of the Chicago Automobile Club, when he received his four-cylinder Ford runabout recently at Detroit, proceeded to carry out his promise made to Henry Ford at the A. C. A. banquet at the Waldorf-Astoria, to drive the little car from the Detroit factory to Chicago. Mr. Mudd agreed with the friend who accompanied him, that at no time should the car be driven at a speed to exceed 25 miles per hour. For several days previous to the start there had been heavy rains, and it was still raining when the car, with its two passengers, left Detroit. The first 170 miles was over wet clay and sand roads. The entire run was made in 17 hours 44 minutes. In the first hour after leaving South Bend just 25 miles were covered. At one time the rule was suspended for five minutes, during which time the car maintained a steady speed of 38 miles per hour. A Warner auto meter was applied to the car, so that the speeds made are authentic.

## NEW AGENCIES ESTABLISHED.

The Healy Leather Tire Company has opened a branch at 1906 Broadway, New York City.

E. P. and M. W. Maxwell, two experienced machinists of Roanoke, Va., have formed a copartnership under the name of Maxwell Bros., and opened an automobile repair shop, at 20 Church avenue, that city.

The following firms have secured the agency for the Wayne cars in their respective towns: Brown Buggy Co., Waterloo, Ia.; C. R. Benefield, Dallas, Tex.; Gordon Jewelry Co., Shreveport, La.; T. W. Hobron, Honolulu, H. T.; Randall Motor Car Co., Ft. Wayne, Ind.; M. A. Shuey, 11 O.S. Wayne street, South Bend, Ind.; W. E. West, 833 West Myrtle street, San Antonio, Tex.; Lakdel Auto Co., St. Louis, Mo.

## PERSONAL TRADE MENTION.

George C. John, the new sales manager of the St. Louis Car Company, which makes the American Mors, left St. Louis last Saturday in an American Mors on a trip to New York, and will visit the agencies en route.

G. M. Ritchie, formerly superintendent of the Autocar Company, Ardmore, Pa., and later superintendent of the Royal Motor Car Company, of Cleveland, Ohio, has taken a position as superintendent of the Continental Motor Manufacturing Company, of Muskegon, Mich.

A. S. LeVino, formerly western sales manager of the Maxwell-Briscoe Motor Company, has resigned to take a position with the Ajax Standard Tire and Rubber Company. Mr. LeVino will travel extensively for the Ajax concern, and will, in addition, have general charge of the metropolitan district.

Mrs. Frances A. W. McIntosh, formerly advertising manager of the Standard Tool Company, Cleveland, O., and more recently connected with the advertising department of *Power*, New York, now has charge of the publicity department of the Norton company, Worcester, Mass., the appointment taking effect August 1.

## JONES' SPEEDOMETER'S MEDALS.

British automobilists are very partial to contests for the various items of equipment that go to make an automobile complete, and among the recent competitions was one for speed indicators, held by the Automobile Club of Great Britain and Ireland. The Jones speedometer, one of the instruments

entered for this contest, came through the entire run with a perfectly clean score, and was awarded the gold medal illustrated by the accompanying views. In making the award, the judges declared the instrument to be a most reliable speed-indicating device, and Mr. Jones accordingly feels pardonable pride in the performance of his speedometer.

# INFORMATION FOR BUYERS.

AUTOMOBILE TOOL KIT.—When a new car is purchased it is sometimes found to be supplied with a good kit of tools, and sometimes there are only the bare necessities in this line. And the automobilist, unless he has had a good deal of experience, does not always know just what he is likely to need. The problem of what tools to buy is solved by the "Tourist Autokit" placed on the market by Hammacher, Schlemmer & Co., of

TOURIST AUTOKIT TOOL ROLL.

Fourth avenue and Thirteenth street, New York. This kit consists of a heavy canvas roll, with leather-bound edges, containing thirty-eight tools and articles that the automobilist is likely to need at some time or other. The tools are all held in place by leather loops. In the outfit will be found soldering materials, solid double-ended spanners for nuts from 1-8 to 5-8 inch, alligator and monkey wrenches, cutting pliers, pipe pliers, heavy and light screwdrivers and files, hammer, chisels and punches, chain holders, scrapers, hydrometer, emery, emery cloth, cotter pins, and so on. The illustration gives an excellent idea of the variety of tools in the kit, and the manufacturers state that each is selected with a view to rendering the best possible service under the hard usage tools are apt to get in automobile repair work. The complete kit weighs eighteen pounds.

TIRE SAFETY VALVE.—Owing to an unfortunate misunderstanding, a number of errors were made in describing the perfected Arnold tire safety valve, made by the Tire Safety Device Company, of 214 West One Hundred and Twenty-fourth street, New York. A correct description of the valve will be found herewith, and it should also be noted that the valve is called a *safety* valve, not a relief valve. The appliance consists of a small brass valve, which is screwed onto the ordinary tire valve in place of the cap. When the safety valve is screwed home the projecting stem of the tire valve is engaged by a corresponding projection in the safety valve, and this transfers the air pressure from the tire valve to the safety valve. The latter is held closed against the air pressure by a spring; consequently, if for any reason the air pressure in the tire rises sufficiently to open the valve against the spring, the air will escape until the pressure is reduced to a point where the spring can again close the valve against the air pressure. The spring is carefully adjusted at the factory for the car it is intended for. When ordering, the customer states the make of car, weight and size of tires, and the valves are set to the proper pressure of air for the tires of that particular car. If the tires are pumped up harder than they should be, the excess of air will blow off and the pressure drop to the right point when the valve is screwed on, and if the pressure rises through the excessive heating it will cause the valve to blow off and bring the pressure down to the normal. Each valve is stamped with the pressure at which it is adjusted to blow off, and each valve is separately tested and adjusted under actual air pressure and set by an accurately calibrated air gauge, and will blow off at exactly the right pressure. A question that frequently arises in connection with this valve is the effect of the increased pressure caused by the car going over bumps or dropping into ruts. The manufacturers state that while the sudden rise of pressure may cause a slight loss of air, the loss is inappreciable owing to the valve being open for only a fractional part of a second. The loss, in fact, may be ignored, according to one who used a car constantly for three weeks without reinflating the tires, notwithstanding that Arnold valves were fitted and that the car was driven over some very rough roads.

GRAPHITE GENERATOR BRUSHES.—An interesting little pamphlet issued by the Joseph Dixon Crucible Company, of Jersey City, N. J., describes how the company hit on the idea of using graphite brushes for dynamos. The company had occasion to install a generator to furnish light and power for one of the factory departments, and, having trouble with the brushes and commutator, tried a set of experimental graphite brushes to see if the difficulties could not be got rid of by this expedient. The results were so satisfactory that graphite brushes were applied to all the dynamos used at the time and subsequently put in. There are now three large generators and about a hundred motors in the Dixon factory, all equipped with graphite brushes. When the factory experiments had proved successful the brushes were placed on the market, and are now to be found on motors and dynamos in all kinds of service.

SPARK PLUG PROTECTOR.—Anything that will prevent the fouling of the spark plug points inside the cylinder of an explosion motor is useful to the automobilist who is

ZENITH SPARK PLUG PROTECTOR.

weary of taking out his plugs and cleaning them. The novice who persists in using too much oil and an excessively rich mixture is particularly liable to get his plugs sooted, and as a cure for such troubles the Zenith Novelty Works, of 280 South Front street, Grand Rapids, Mich., has brought out the plug protector shown in the accompanying illustration. It is a simple one-piece extension, which, screwed into the spark plug hole in the cylinder, causes the plug, when screwed into the protector, to set back in a little recess, where it is protected from carbon and oil, and the in-and-out rush of the gases keeps the points scoured clean. The Zenith protector is made of steel, and with United States or metric threads, to suit any plug.

POSITIVE LOCK WASHERS.—When a nut works loose from its bolt on an automobile, and perhaps finally drops off and is lost, there is no telling what disastrous results may follow; and when a number of nuts work loose the machine is apt to be damaged by the relative movements of parts that should be rigidly held. The lock-

PLAIN SPRING LOCK WASHER.

washer is a device that will hold the nuts where they belong without taking up appreciable space. The second of the illustrations show the lock-washer manufactured by the Positive Lock-Washer Company, of Newark, N. J., especially for automobile use. The washers are thin, and the sharp

POSITIVE LOCK WASHER.

edges of the turned-up ends bite deeply into the nut and the surface under it. The plain spring washer answers well enough where the vibration of the parts is not great, but for the most severe service the "Positive" washer is the best. Both styles are manufactured by this concern, but the "Positive" washer is the one intended for automobile work.

DUST-LAYING COMPOUND.—As transportation methods are improved and travel increases, roads assume an increasing importance and their condition becomes more and more a matter of concern to those who use them. Dust is nothing more or less than the ground-up road material, and when this is lifted in clouds by the wind and blown away, or is whirled up from the road by passing automobiles, just so much of the road itself is lost, to say nothing of the inconvenience to travelers. A number of compounds have been experimented with for the purpose of binding the surface and thus preventing the literal blowing away of the road, and also doing away with the dust nuisance—the latter a feature which is very often thought more of than the gradual disintegration of the road. One of the compounds so used is known as Tarvia, and is made by the Barrett Manufacturing Company, of New York, Chicago and a number of other prominent American cities. Tarvia is a coal-tar compound. In a pamphlet recently issued by the manufacturers there are extracts from a report, made to the United States Department of Agriculture, on experiments made with Tarvia at Jackson, Tenn. A number of sections of macadam road were treated with Tarvia with excellent results, the road surfaces being still in excellent condition after the lapse of seven months, including the winter of 1905-'6. The pamphlet, together with information regarding Tarvia, can be obtained at any of the Barrett company's offices on request.

MUTUAL AUTO ACCESSORIES COMPANY, NEW YORK.—Illustrated catalogue of automobile accessories and clothing. A useful list of automobile records is included.

HAYES MANUFACTURING COMPANY, DETROIT, MICH.—Booklet giving an excellent idea of the plant and facilities of this concern for turning out all kinds of sheet metal work and also iron forgings. No stock is carried, all work being done on order to sketch or drawing.